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An analysis of the implementation and effect of early industrial policies in the United States

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by

Gary L. Brister

September 1993

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This thesis provides a brief historical overview of federal policies designed to promote the expansion or economic viability of certain industries. Federal railroad, irrigation, and tariff policies are then explored in greater detail to determine their effect on both the target industry and the economy as a whole. The outcome of this study can assist in determining the desirability of an expanded role by the Federal Government and specifically the Department of Defense (DOD) through the Advanced Research Project Agency (ARPA), into a more broad based industrial policy.

The past and present federal policies dealing with the railroads, irrigation, and tariffs have all failed to make any of the target industries financially self sustaining. They have instead created a number of bureaucratic bodies designed to service the needs of their respective industries. The aggregate costs of these programs far exceeds any imagined benefit. To adopt similar policies within DOD in order to target specific industries for the promotion of economic rather than national security concerns would only prove detrimental to both.

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An Analysis of the Implementation and Effect of Early Industrial Policies in the United States

by

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Lieutenant, United States Navy
B.A., University of Oklahoma, 1987

Submitted in partial fulfillment
of the requirements for the degree of

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ABSTRACT

This thesis provides a brief historical overview of federal policies designed to promote the expansion or economic viability of certain industries. Federal railroad, irrigation, and tariff policies are then explored in greater detail to determine their effect on both the target industry and the economy as a whole. The outcome of this study can assist in determining the desirability of an expanded role by the Federal Government, and specifically the Department of Defense (DOD) through the Advanced Research Project Agency (ARPA), into a more broad based industrial policy.

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I. INTRODUCTION

In recent years the notion of a federally sponsored industrial policy has been taking root within both economic and political circles. Specifically within the Department of Defense (DOD), this "partnership" between industry and government has taken on a new name, if not new form, in the Advanced Research Project Agency (ARPA). The notion of DOD dollars being used to fund research in the private sector is nothing new. What seems to be new, at least within DOD, is the trend away from defense specific agendas to a more broad based approach of targeting selected industries with federal funds in an attempt to assist that target group enhance its competitive stature and capture a greater market share within the private sector.

The primary goal of this thesis is to discover whether or not the ideas embedded in an industrial policy are indeed novel, or simply a redefinition of something that already exists. This thesis will explore previous examples of federal intervention into the economy and attempt to evaluate the reasoning behind the policies, their effect, and what conclusions may be drawn for the future.

The following questions will be addressed throughout the paper: Is the government better able than the market place to spot sunrise industries? Does the government, and will DOD specifically, make investment decisions based primarily on national security, political, or economic rational? Is government able to allocate resources towards industrial development in a way that is more efficient and effective than the private sector? Does federal involvement serve to strengthen or weaken the target industries? And can

such a policy be implemented in a way that is fair and equitable to all players within our "social contract?"

Chapters II, III, and IV deal with three specific policies designed to influence industrial economic development. Chapter II will address the Federal Government's role in the railroad industry. Chapter III explores the Federal Government's role in irrigation projects. And Chapter IV deals with the historic use of tariffs to shelter and promote specific industries. These three areas of federal involvement provide a well rounded overview of the various ways in which governmental action can shape economic events. The final chapter will provide a conclusion based upon the findings from the previous chapters. The costs and benefits of federal intervention will be assessed, along with the desirability of future federal involvement in other industries. For reference, Appendix A presents a broad overview of most of the significant industrial policies which have been implemented by government between 1789 and 1993.

II. RAILROADS

In 1869, the first transcontinental rail line was completed by the Union Pacific and Central Pacific railroads. This began the westward expansion of the railroads (Ref. 7:p. 194). By 1890, there were 1013 railroad companies and just under 200,000 miles of track, up from 35,000 miles in 1865 (Ref. 7:p. 194). The industry expanded rapidly during this time period with nearly three times the number of independent railroads as exist today. Why then did this industry fall prey to an onslaught of regulatory measures beginning in 1887? This issue will be explored later.

The first section of this chapter will present a chronological description of all the regulatory acts which impacted the industry. This will be followed by sections dealing with federal land grants, loans, and subsidies to the railroad industry. The concluding section will analyze the impact of these programs upon the industry and economy as a whole.

A. REGULATORY HISTORY

The first regulation of the railroad industry was conducted by the courts in accordance with the English tradition of common carriers. Railroads were expected to conform to the following policies: the carrier may not refuse to serve; the carrier must serve at a reasonable price; the carrier must serve all equally; and the carrier is responsible for the safe delivery of the goods or persons committed to its care (Ref. 8:p. 20). This process soon grew chaotic with judiciaries putting forth numerous and differing legal

interpretations. The courts soon requested formal regulations with greater specificity and continuity. Many states took on this challenge.

FEDERAL REGULATION OF THE RAILROAD INDUSTRY

REGULATORY ACT	DATE
Supreme Court Ruling	1886
Interstate Commerce Act	1887
Elkins Act	1903
Hepburn Act	1906
Mann-Elkins Act	1910
Army Appropriations Act	1916
Transportation Act	1920
Motor Carrier Act	1935
Transportation Act	1940
Reed-Bullwinkle Act	1948
Transportation Act	1958
National Rail Passenger Act	1971
Regional Rail Reorganization Act	1973
Railroad Revitalization and Regulatory Reform Act	1976
Staggers Act	1980

TABLE 1 (Ref. 8)

States attempted to impose their own regulations beginning in the 1870's. Between 1873 and 1876, the Grange was very influential in legislating state railroad regulations in Illinois, Iowa, Minnesota, and Wisconsin (Ref. 2:p. 443). This proved to be the catalyst that drove numerous states to impose their own railroad regulations. In 1886, the Supreme Court ruled that states were not empowered to regulate interstate commerce (Ref. 8:p. 22). This put the regulatory ball directly in the federal courts.

In 1887, the Interstate Commerce Act was passed to consistently enforce a number of legal principles already on the books. It required that rates be "just" and "reasonable",

prohibiting discrimination against persons, shippers, or geographic areas. It also forbade the practice of charging more for a short haul than a long one (Ref. 8:p. 23). Finally, it forbade colluding to control the amount of service provided and pooling equipment in that service.

In an attempt to level out rail rates, some railroads joined together to establish standardized rates. There was discontent among those passengers in high volume areas who were likely to pay higher fares in the form of a cross subsidy. This led to the Trans-Missouri Freight Association Case in 1897 and the Joint Traffic Freight Association Case in 1898. The Supreme Court ruled that contracts between railroads used to regulate pricing were a violation of the Sherman Act. The railroads responded to this decision by merging and consolidating to limit regional competition. However, the consolidation effort was turned back by the Northern Securities Case of 1904 (Ref. 2:p. 336). Finally, the railroads were forced to turn to the government for assistance in pricing policies. This authority was latter given to the Interstate Commerce Commission (ICC).

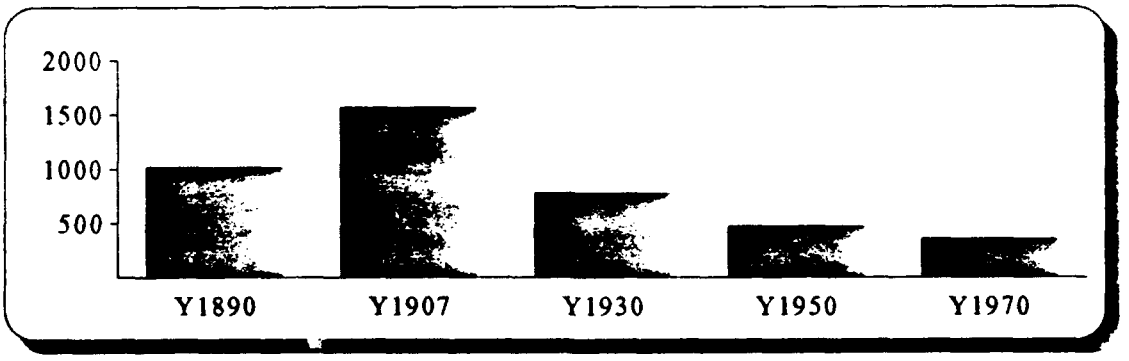
A number of related acts followed the Interstate Commerce Act, the first of which was the Elkins Act of 1903. This act stated the punishment for discriminatory pricing (Ref. 8:p. 23). The consequences of price discrimination were not defined by the Interstate Commerce Act.

The Hepburn Act of 1906 gave the ICC the right to set maximum rates (Ref. 8:p. 23). This made many rural routes unprofitable given the high fixed costs of rail transport.

Because of this, the number of railroads peaked at 1,564 in 1907 and has steadily declined to this date (see Figure 1).

The Mann-Elkins Act of 1910 plugged loopholes in the law prohibiting higher rates for short hauls than for longer ones (Ref. 8:p. 23). This proved very popular with the farming community located in rural areas.

The ICC also sanctioned what came to be called "value-of-commodity" pricing (Ref. 8:p. 24). High valued items were viewed as having lower demand elasticity than relatively inexpensive commodities of the same weight. Therefore, the more valuable a commodity was per ton the higher the total shipping cost as a percentage of the total tonnage. This provision benefited both the railroads and the farmers and created a pricing system which was closely associated with monopoly pricing techniques. Although the policy was not considered to conflict with the Interstate Commerce Act or its subsequent amendments, it certainly went against the spirit of the original regulations.



Number of Operational Railroads From 1890 to 1970
Figure 1 (Ref. 1:p. 727-728)

With a threat of a national strike by the "operating brotherhoods" in 1916, the Adamson Act was passed in an attempt to appease the unions. It implemented a standard eight hour

work day. This failed to satisfy the unions and in 1917 it appeared as if a strike was once again immanent. President Wilson believed that a railroad strike would create a national emergency given the importance of war time mobilization. Thus, he employed the Army Appropriations Act of 1916. This allowed for a Federal Government takeover of the railroads. This occurred on December 26, 1917 (Ref. 9:p. 145). To entice the unions, substantial wage increases were granted, beginning on January 1, 1918. An eight-hour work day was established for those railroad workers who did not already enjoy such conditions, with time and a half wage rates for overtime work.

The first in a series of Transportation Acts was passed in 1920. The primary function of this Act was to reverse the nationalization that occurred during W.W.I, and return the railroad industry to private ownership. It allowed the ICC to set minimum rates. It also allowed the ICC, not the states, to control the entry and abandonment of rail routes. The ICC was able to limit competition in many areas by limiting entry. This produced higher rates where required to subsidize the unprofitable lines. It also promoted mergers among railroads, creating a cross-subsidy for those weaker railroads which would have a difficult time surviving on their own. In the event that the cross subsidies proved insufficient, then direct subsidies were offered in the form of guaranteed loans to weaker railroads.

The attempt to promote mergers between the profitable and unprofitable companies proved unpopular with the profitable railroads. Because of this opposition, the ICC abandoned its efforts to force mergers. Instead it passed the Motor Carrier Act of 1935

which regulated the railroads' competition. The trucking industry had developed into a real problem for the railroads, especially within the short haul market. The ICC decided to regulate both rates and entry into the trucking industry in order to ensure price parity between railroads and trucking.

The Transportation Act of 1940, extended the provisions of the Motor Carrier Act to barge transportation. Both provisions provided certain exemptions: All motor carriers of agricultural commodities were exempt from regulation; all single vessel water carriers of bulk commodities, or tow of barges containing no more than three distinct commodities were also exempt. In addition, when a carrier proposed a rate reduction, it was now up to the carrier to justify the rate increase as "reasonable." Previously, someone who objected to the reduction had to prove it "unreasonable." Finally, "a preamble was also added to the Transportation Act of 1940 which stated that the ICC was to pursue policies adequate to the needs of commerce, defense, and the postal system, and that would bring about sound economic conditions among the carriers." (Ref. 8:p. 27)

The Reed-Bullwinkle Act of 1948, established rate bureaus for both rail and truck transportation which served as a rate setting board.

The Transportation Act of 1958, amended the 1940 Act to state that "rates of a carrier shall not be held up to a particular level to protect the traffic of any other mode of transportation." This was later modified with a statement indicating that consideration must also be given to the objective of "preserving sound economic conditions among all the operators" (Ref. 8:p. 29). It also allowed for guaranteed loans to railroads in order to

help those lines which were in financial trouble. It granted the ICC, not the states, authority to discontinue passenger train services. Service was discontinued if it was no longer needed for public convenience and necessity, or if its deficits were an undue burden on interstate commerce.

The National Rail Passenger Act of 1971 created Amtrak to relieve the railroads of the burden of maintaining unprofitable passenger services. Railroads had to pay a significant initial amount to turn service over to Amtrak. They then had to grant Amtrak national access to rail lines at a rate below their actual costs (Ref. 8:p. 32).

Penn Central petitioned the ICC for permission to abandon 9,000 miles of unprofitable track. The request was refused and Penn Central went into bankruptcy (requests were usually disapproved if there was strong protest from shippers or local authorities) . This lead to the Regional Rail Reorganization Act (3R) of 1973. It established the Railway Association to reorganize railroads in the Northeast from private to public ownership. Conrail was formed out of the old Penn Central and several other bankrupt carriers in the Northeast. Conrail contained 3,000 miles less track than its parent lines. (Ref. 8:p. 33)

The Railroad Revitalization and Regulatory Reform (4R) Act of 1976 was passed when financial problems within the railroad industry began to spread beyond the Northeast. The reform stated that no rate above variable costs should be considered unreasonable, unless someone contesting it could prove otherwise. It stated that the ICC should completely deregulate traffic where rail transportation had no monopoly power. The commission was instructed to take the financial health of the railroad industry into

consideration. In areas where a railroad did not dominate the market, the railroad was free to increase or decrease rates seven percent without regulatory approval. The time period was shortened within which the ICC must deal with a merger application and directed the Secretary of Transportation to facilitate mergers and other coordination projects. It also established that a railroad cannot be forced to provide service on which it loses money. Return on investment was included in the estimate of "costs." It also limited the time to complete deliberation to make it easier and less costly for railroads to pursue abandonment. It stated that shippers who depend upon a service which files for abandonment should consider paying higher rates for the service or form their own shipping companies. Finally, it provided subsidies for lines which the ICC had approved for abandonment, but which local authorities could demonstrate a need for continued service. After the Act was passed, the ICC emasculated the provision giving railroads seven percent rate flexibility where the railroads had no market dominance. The ICC argued that if the railroads had the discretionary power to raise rates in this way, then they had such dominance. The courts upheld the commission on this. (Ref. 8:p. 35)

The Staggers Act of 1980 specified a ratio of revenues to variable costs that determined if a carrier had market dominance. This ratio was 160 percent in 1980 and was raised annually in five percent increments until 1985. The ratio allowed after 1984 depended on the railroads ability to earn an "adequate" return on its investment. The Act also established a rate floor. The floor was set equal to variable costs. It allowed the

commission to exempt certain rail transportation from regulation when there was strong intermodal competition. It phased out the right of railroads established in the Reed-Bullwinkle Act of 1948 to collude through rate bureaus. It allowed only for collective rate setting on joint interline rates. Contract rates were generally allowed if their terms were publicly available and on file with the ICC. Contract rates could be opposed if it could be proven that they represented unfair discrimination, but not by competing carriers. It required that the railroad abandonment process be completed within 255 days, including responses to appeals. Opportunity costs were also considered in rail line profitability, making the process of abandonment easier. It mandated that if an unprofitable rail line was forced to operate, that the railroad should receive a subsidy to ensure an adequate return on investment (not just variable and fixed costs). It set a time limit of 300 days when deciding a merger request. It also included labor protection for Conrail employees. (Ref. 8:p. 102)

The regulatory history of the railroads not only reveals the extent to which government involved itself in the industry, but also some of the motivations behind the intervention. Regulations which were initially designed to protect selected consumers soon gave way to policies more concerned with the interests of both the industry, and to a greater extent, the government bureaucracy designed to service it. The economic impact of these policies will be dealt with in the concluding section. The next two sections will deal with federal land grants, loans, and subsidies to the railroads.

B. LAND GRANTS

The earliest direct Federal Government influence on industrial development occurred with land grants. Land grants were first issued for the construction of wagon roads in 1823. This policy was extended for canal construction in 1827 and for river improvements in 1828. Later, the government wanted to expedite the railroads expansion westward. To achieve this, it relied on both land grants and financial assistance. Land was given to railroads by all levels of government for depots, yards, and cross country rail lines, although it was primarily a federal effort. In addition, loans were extended in the form of bond purchases. (Ref. 2:p. 328)

Land grants for the railroads were initiated in 1850. This policy was modified in 1864, to increase the size of the land allotments. The new policy allowed each rail line to receive a 400 foot right of way and the free use of timber and building materials from government lands (Ref. 2:p. 328). The railroads were also granted ten alternate sections of land on each side of the track, or 12,800 acres of land for each mile of railway completed. Northern Pacific received an even more generous offer. They received 20 alternate sections of land for each mile of track laid in the states, and 40 sections in the territories.

The new legislation also allowed for loans, ranging from $16,000 to $48,000 a mile, depending upon the terrain of the construction area (Ref. 2:p. 328). The Union Pacific and Central Pacific railroads were paid after laying each twenty miles of railway. The government was issued second mortgage bonds from the railroads in exchange. The railroads agreed to allocate five percent of their net returns towards debt retirement, and

one-half of the revenue received from shipping government cargo or personnel (Ref. 2:p. 329).

The Federal Government gave about 175,350,000 acres of land to railroads between 1850 and 1871, when the land grant policy was finally terminated (Ref. 2:p. 330). Of this, about 35,000,000 acres were forfeited because railroads failed to uphold construction requirements. The railroads also received 48,883,372 acres from nine states, bringing the land grant total to about 190,000,000 acres (Ref. 2:p. 330).

Prior to 1927, the railroads were able to sell their land for an average of $3.42 an acre (Ref. 2:p. 330). It has been estimated that by 1927 total land sales for the railroads amounted to about $489 million after deducting administrative costs.

Some problems did begin to develop among railroads involved in the land grant program. Many railroads were built in underdeveloped and largely non-populated territories. The lack of traffic volume increased rates to overcome the high fixed operating costs. Many of these lines eventually went bankrupt. The land grant policy also generated a land grab atmosphere. This encouraged rushed and often faulty construction, increasing long-term operation and maintenance costs. In some cases, ties were placed on the ground and the rails spiked to them without constructing a road bed (Ref. 2:p. 330). Union Pacific and Central Pacific actually raced for land. For many miles, the two railroads ran parallel to each other. Fights often broke out between the two competing construction crews.

In a number of cases, the contract for building a railroad was given to a construction company owned or controlled by the promoters and their friends in both government and financial circles. In these cases, the contract price was likely to be much higher than the actual cost of construction. The owners of the company would simply pocket the difference. This resulted in number of national scandals. In the case of Union Pacific, the Credit Mobilizer, who was in charge of handling the construction contracts for Union Pacific, issued a contract for the first 100 miles of construction at a cost of $60,000 a mile. The engineers' estimate was $30,000 a mile (Ref. 2:p. 331). Because of the inflated estimates, the profits of the Credit Mobilizer ranged from 50 to 100 percent on its investment. A similar situation developed with the Central Pacific. Central Pacific paid $120 million for a project whose actual cost amounted to only $58 million (Ref. 2:p. 331). This type of behavior combined with the land grant policies themselves led to an over expansion of the railroads. In subsequent years many railroads could not earn enough money to pay dividends on their stock. It has been estimated that railroad debt amounted to $7.5 billion in 1883 (Ref. 2:p. 331). They had the ability to carry far more freight than was typically shipped. Even in 1890, one of the more prosperous years, only one-half of all railroads were earning enough money to pay dividends on their stocks. In 1897, only 30 percent could pay dividends. The graft and bribery which was common within the railroads throughout this period destroyed public confidence in both the railroads and government. This led to a drive for greater railroad regulation.

The last land grant was extended in 1871. From that time forward the only direct financial assistance was provided in the form of federally guaranteed loans and federal subsidies. The following section will explore these policies as they have evolved to date.

C. LOANS AND SUBSIDIES

The Federal Government also used loans and subsidies to assist and influence railroad development. The government occasionally offered low-interest guaranteed loans to various "poor" railroads as far back as the Transportation Act of 1920 (Ref. 8:p. 121).

The Transportation Act of 1958 was used to prop up weak railroads through federally guaranteed loans. These loans could be justified only in political terms. In the case of the New Haven Railroad, its financial weakness was largely due to its inability to discontinue its unprofitable passenger rail service. (Ref. 8:p. 31)

Federal loans to the railroads between 1976 and 1988 took three basic forms (see Appendix D): rail line rehabilitation; railroad programs; and United States Railway Association. Loans to the United States Railway Association totaled over $3.1 billion between 1976 and 1980. Loans to railroad programs began in 1979, and totaled $210 million by 1982. Loans directed towards rail line rehabilitation began in 1981 and totaled $184 million by 1988.

Conrail received federal subsidies of roughly four billion dollars between 1976 and 1981 (Ref. 8:p. 33). The Railroad Revitalization and Regulatory Reform Act also subsidized low-density and other unprofitable services outside the Northeast. The 4R Act channeled money into these less successful private railroads at a rate of about $500 million a year.

Capital and operational grants to Conrail totaled over three billion dollars from 1976 to 1981. The subsidies to Conrail have been used for an extravagant employee protection plan. The plan guarantees a lifetime pension at his most recent wage. To any worker laid off after the formation of Conrail (who has been employed for five years or more) the worker also receives whatever general wage increases would have occurred over his lifetime.

Similarly, a large part of 4R money for rail rehabilitation has been spent on restoring routes of faltering railroads. George W. Hilton, in his book entitled "The Transportation Act of 1958," was probably right when he said low interest loans fulfill little function save to postpone the day when a carrier goes bankrupt, with more loss than gain to society in the process. (Ref. 8:p. 122)

Subsidies within the 1976 act provided more than $500 million over a four year period to subsidize money-losing branch lines, $600 million in grants for the rehabilitation of main lines for financially weak railroads, one billion dollars in guaranteed loans for the same purpose, $1.75 billion to upgrade Amtrak's Boston-Washington route, and $2.1 billion in subsidies for Conrail (1976-80). (Ref. 8:p. 35)

Railroad construction loans totaled about $65 million (Ref. 2:p. 331). The record of payments on these loans was very good, with $125 million of the $130 million due in principal and interest paid by 1900. Ultimately, $63 million of the $64 million of principal, and $105 million in interest, was paid, for a total of $168 million on a $65 million loan (Ref. 2:p. 331).

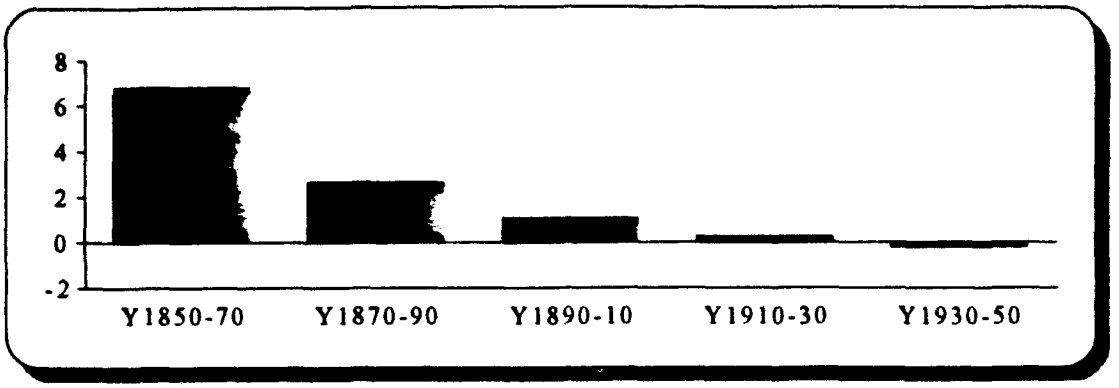
The "betterment accounting" method is another hidden subsidy. It allows railroads to write off investments in rails and ties for tax purposes in the year those investments are made, rather than depreciating them over time. Since rails last up to fifty years and ties twenty-five years, this rapid write-off reduces the railroads' corporate tax liabilities.

Between 1966, when the Department of Transportation was established, and 1991, total budgetary expenditures by the Federal Railroad Administration (FRA) have amounted to over $23.6 billion (see Appendix B). The FRA budget declined from a high of over $3.6 billion in 1981 to just under $538 million in 1988. This declining trend was reversed however, and the budget climbed back up to $948 million in 1991.

D. CONCLUSION

The primary arguments in favor of greater federal involvement in the railroad industry dealt with the need to both expand rail services, through land grants and later subsidies, and to protect the consumers from transportation monopolies by means of regulatory reform. At least in terms of early expansion, land grants seem to have been all too successful.

The early debt of the industry (see Figure 2) was in no doubt largely brought about as a result of an overly generous federal subsidy in the form of land grants. There is a direct



Growth in Debt Held by the Railroad Industry
Figure 2 (Appendix C)

relationship between railroad debt and the rate at which track was laid (see Figure 2 and 3). This further demonstrates the relationship between land grants and their effect on excess supply. The primary problem with the land grants is that it made building railroads profitable in the short term without addressing the needs for long term maintenance or profitability.[1] Furthermore, much of the money generated by the grants found its way into construction companies partly owned by those with interest in the railroads. This often generated profits for the construction companies' owners without the share holders taking part in the windfall.

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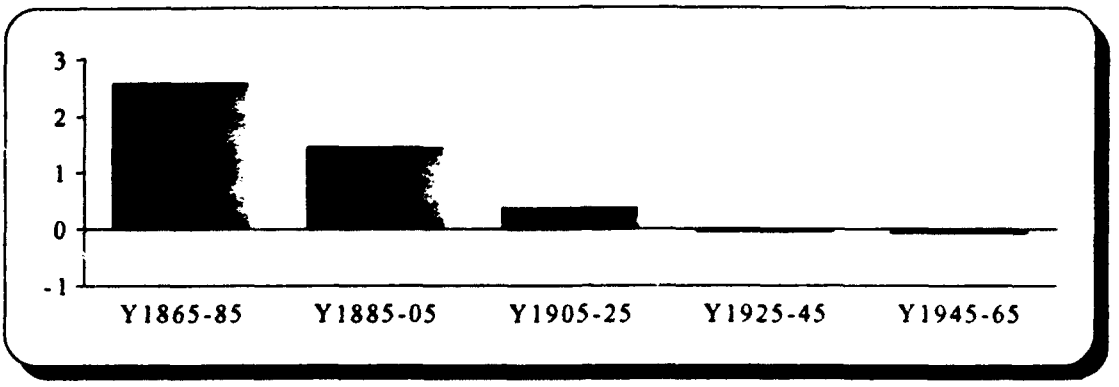
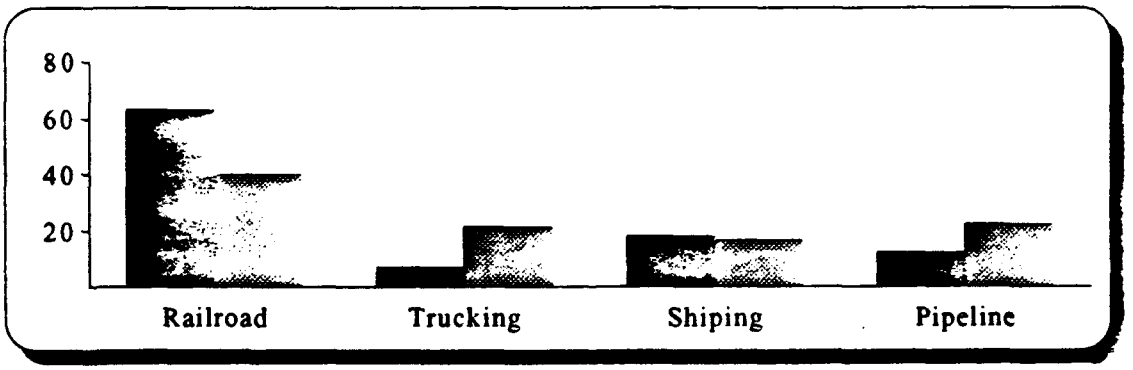
[1] Similar problems with land grants were experienced in the 1860's with the construction of three east west wagon passages in Oregon. Although contractors made returns of over 750 percent over a two year period, the construction was often shoddy and unkeep nonexistent in areas with limited traffic. The net result was to exchange good timber and farm land for three roads which, in hind site, were probably not all needed. Even today, there is no east west highway across southern Oregon where one of the wagon roads was constructed. But even if a need did exist, the benefit of the project was probably not sufficient to warrant the cost. If it were, the road would have been built with private or at least local funds. (Ref. 10:p. 105)



Growth Rate in Miles of Track From 1865 to 1965
Figure 3 (Appendix D)

The second argument in support of federal involvement dealt with the threat of a transportation monopoly within the railroad industry. But, as Figure 4 indicates, air, water, motor vehicle, and pipeline transportation became increasingly important as an economic substitute to the railroads after 1930. The trend away from rail traffic was significant between 1937, the first year in which capacity data was compiled, to 1970 (Ref. 1:p. 707). This points to the importance economic substitutes play in controlling monopoly behavior. Despite an expanded federal effort, rail transport declined in favor of other relatively non-subsidized modes of shipping. Despite all federal efforts, railroad capacity still exceeds demand.



Transportation Trends From 1937 to 1970 as a Percentage (1937 | 1970)
Figure 4 (Ref. 1:p. 707)

Even when substitutes do not exist, the threat of potential competition, and the desire to maximize profits will guarantee some pricing discipline. Monopolists ultimately have to be concerned about the economic viability of their customers.

It also should be pointed out that the very type of monopoly pricing from which the government attempted to protect consumers was later initiated, not by the railroads, but by governmental action. The government consolidation of existing companies, entry restrictions, regulation of the trucking and barge industries, generous subsidies, and price setting was probably more effective than any voluntary cartel because it was enforced by the weight of the law, paid for in part by the tax payers, and included the regulation of competitors outside the industry. It is also interesting to note that whenever the ICC was directed to solve a long-haul/short-haul rate discrepancy, the solution was almost always to increase the long-haul rates to equal the sum of the short-haul rates (Ref. 7:p. 197). Not exactly the solution most consumers would have imagined.

Railroad owners were not surprised by the friendly relationship which emerged between the ICC and many railroads. President Cleveland's Attorney General, Richard Olney, wrote the following letter to the president of the Burlington and Quincy Railroad.

> The Commission, as its functions have now been limited by the courts, is, or can be made, of great use to the railroads. It satisfies the popular clamor for a Government supervision of railroads, at the same time that supervision is almost entirely nominal. Further, the older such a commission gets to be, the more inclined it will be found to take the business and railroad view of things. It thus becomes a sort of barrier between the railroad corporations and the people and a sort of protection against hasty and crude legislation hostile to railroads interest....The part of wisdom is not to destroy the Commission, but to utilize it. (Ref. 11:p. 526)

The relationship between the ICC and the railroads proved beneficial to both parties. The ICC was staffed largely by former railroad employees, since they already had the experience needed to manage the job. This created a natural bias in favor of the industry. Similarly, ICC employees who assisted the railroads were often rewarded with lucrative jobs by the railroads once their ICC stay came to an end (Ref. 7:p. 197). Thus, the ICC had the dual incentive of justifying their own existence, and behaving in a way that would be viewed as favorable by the industry. The automotive industry in the past and the semiconductor industry today appear to be striving for a similar relationship with government.

However, every effort that government made to prop up railroads seemed to be countered by regulations designed to bring them down, or at least prevent them from ever becoming self sustaining. These included pricing regulations, rail line abandonment restrictions, mandating passenger services, short haul/long haul regulations, and car sharing regulations. The ICC had grown in both size and scope and became a powerful bureaucratic body. It seemed to have no intention of surrendering any of its new found authority by allowing the railroad industry to succeed on its own.

ICC price setting has proven costly to both consumers and the railroads, especially since trucking deregulation. Much heavy industrial cargo is being trucked when it could be transported more cheaply via rail if the ICC eliminated value-of-commodity pricing. This policy has created a double inefficiency. Lower valued cargo could be shipped more cheaply by trucking, but it is sent via rail at a subsidized rate; many high valued items are

being sent by truck when they could be sent more cheaply by rail. The total cost of this inefficient allocation is estimated at between $300 million and $3 billion annually (1963 dollars) (Ref. 8:p. 82). Those who view railroads as being a close to perfect substitute for trucking estimate the higher figure. Those who believe that trucking is a preferred shipping median tend to estimate the lower value.

Another inefficiency which developed in the industry results from the long haul/short haul pricing regulations. Since railroads were not allowed to charge more for a shorter haul, they would often divert cargo along a longer route to command a higher rate. This was profitable due to the high fixed shipping costs. Then shipping rates were set between departure and destination locations. This discouraged long hauls by a single shipper; however, if two companies were to split the haul, then they were to divide the costs based on the percentage of the miles which they shipped. This once again led to long hauling in order to capture a bigger percentage of total fees.

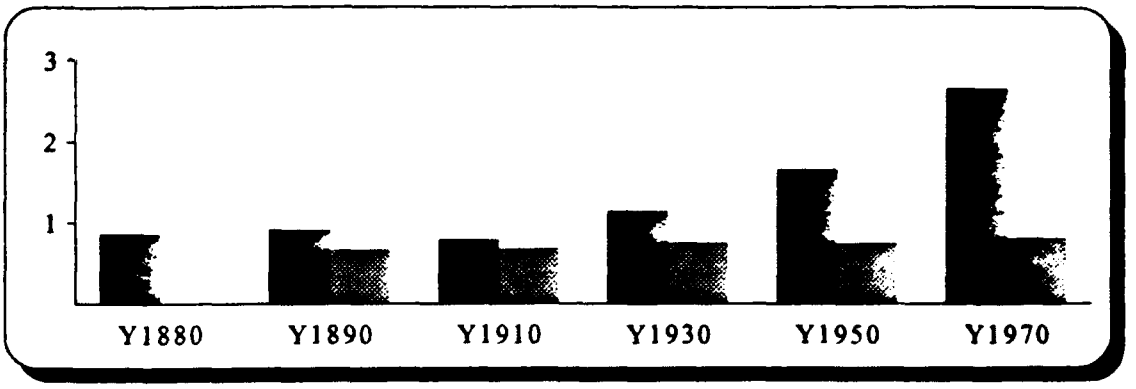
Inefficiencies were also introduced into the system through the rules governing freight cars. Railroads are forced to allow other railroads to borrow their freight cars under the common carrier obligation rules. If these transactions occurred at market prices, then the railroads should be indifferent to such transactions. However, the ICC sets the rates below market pricing. This creates a cross subsidy from the larger or wealthier railroads to the smaller or poorer railroads. Once a smaller railroad had a borrowed car they had little incentive to return it. This led the ICC to enact another policy forcing a railroad to return a borrowed car immediately after its use, along the shortest rail path possible. This

policy also proved to be inefficient. It resulted in cars being shipped empty back to their point of departure. Jason Sumner and Allen Ferguson have estimated the costs of regulation induced inefficient freight car utilization to be between $1.5 and $1.7 billion annually (1977 dollars). (Ref. 8:p. 88)

Inefficiencies were also created by regulations concerning rail line abandonment. Robert Harris did a study of low density branch lines in 1977. He found that if railroads had eliminated all the unprofitable routes, they would have reaped a one-time savings of $1.5 billion in property sales, $2 billion in deferred maintenance, and could have reduced annual operating costs by $140 to $300 million a year (Ref. 8:p. 85). This would have saved a total of about $500 to $600 million annually. Other studies by Ann Friedlaender reach similar conclusions.

Figure 5 shows the adverse effects of the policies which followed the land grants. As the debt of the railroads was diminished, you would expect to see a noticeable decrease in the expense to revenues ratio. However, the ratio remains stagnant. Up until 1930, the total value of all assets of the railroad industry was less than the total debt.

The primary effect of governmental intervention into the rail industry was to distort markets forces in every way imaginable. The general trend of the effort, although it has taken on numerous forms, has been to maintain excess capacity and fund it out of general revenues. It can also be argued that government policies have actually limited competition



Total Value/Total Debt of Railroads From 1880 to 1970 and
Operational Expenses/Operational Revenues From 1890 to 1970
Figure 5 (Appendix C and D)

while at the same time it has created a dependent industry, and a nationalized industry in the case of Conrail and Amtrak. Rates are no doubt higher than they otherwise would have been in high traffic areas; in low traffic areas, the costs associated with maintaining rail access in no way equal the benefits. Cross subsidization and other regulations have injected numerous inefficiencies into the industry, which are ultimately absorbed by the economy. The reputations of both the industry and the government were damaged by the scandals which occurred in implementing federal policies. And the political process was used as a means of distributing the economic pie in order to award benefits to those groups which exercised political clout. This is a trend which will be repeated in the following chapters, and which may be the most damaging aspect of the entire policy of federal intervention.

III. FEDERAL IRRIGATION POLICY

A. HISTORICAL OVERVIEW

An historical overview of federal irrigation policy begins with the first irrigation in the western United States. It was conducted by the Mormons around Salt Lake Valley in Utah. In 1847, they began diverting water to irrigation ditches and planted potatoes. By 1848 they had 5,000 acres of land under irrigation (Ref. 12:p. 13). In 1870, irrigation was later used in the Union Colony on the Cache La Poudre River north of Denver (Ref. 12:p. 14). In 1871, other colonies in California located in Anaheim and Riverside began to use irrigation (Ref. 12:p. 14).

The first major federal irrigation effort in the western states occurred in 1877 with the passage of the Desert Lands Act. It granted title to 640 acres of land (reduced to 320 acres by an 1890 amendment) at $0.25 per acre (plus a $1.00 filing fee per tract). In turn, the settler had to divert water in order to "reclaim" the land within three years (Ref. 12:p. 15). Subsequently the land could be patented at $3.00 per acre.

In 1888, Senator Stewart of Nevada introduced a bill appropriating $100,000 to the U.S. Geological Survey to identify lands which should be reserved for reservoirs (Ref. 12:p. 15). John Powell, who had spent a great deal of time studying the western states, was put in charge of conducting the actual survey. One hundred and forty such sites were examined by 1900, and 10 reservoir projects were estimated in detail (Ref. 12:p. 15). In order to prevent speculators from purchasing up the blocks of land surrounding the proposed reservoir projects, the bill also withdrew homesteading from the lands connected

with these reservoirs so that the land could be properly designed, situated, and constructed. Powell believed that this bill was essential to developing a federal irrigation plan in the western states. The result was that the Land Office had closed nearly the entire public domain to new entry by 1890. This amounted to about 800 million acres and met much public uproar (Ref. 12:p. 16). This put Powell's survey directly in the path of western settlement, *the initial objective of the proposed water projects*. Congress repealed these restrictions in 1890, but retained the withdrawal of land for potential reservoir sites.

The decades between 1880 to 1890 proved to be a boom period for private irrigation (Ref. 12:p. 16). Companies sold stocks and bonds to finance projects in many parts of the West. Pamphlets were often sent out by project owners and railroad companies to potential settlers in order to encourage western settlement. Irrigation congresses were also held by irrigation enthusiasts starting in 1891. Many of these gatherings attracted a large number of political leaders who transported many of the conference ideas back to Washington.

The Carey Act of 1894 was the first major federal effort to place land under irrigation. Each state was granted up to one million acres of federal land provided that the state arranged for its irrigation. States were encouraged to contract with private parties to construct the irrigation projects on the land they would received under the Act; however, only Wyoming took advantage of the offer. It acquired 11,321 acres of federal land and

placed it under irrigation (Ref. 12:p. 19). One of the reasons the Act had little effect was that *much of the high quality land was already being settled*.

At the irrigation congress of 1896, George Maxwell advanced the idea of a direct federal irrigation policy instead of the current land grant policy to the states (Ref. 12:p. 19). Mr. Maxwell went on to form the National Irrigation Association which lobbied in favor of federal irrigation legislation. The case for a federal policy was further enhanced by Captain Hiram Chittenden of the U.S. Army Corps of Engineers. He issued a report in 1897 advocating the need for flood control reservoirs in Wyoming and Colorado (Ref. 12:p. 19). The flooding of Imperial Valley in California in 1891, by a change in course of the Colorado River also helped to support this view (Ref. 12:p. 20). By 1900, both the Republican and Democratic platforms advocated a direct federal role in irrigation policy.

The passage of the 1902 Newlands Bill, also called the Reclamation's Act, finally put the Federal Government into the irrigation business (Ref. 12:p. 21). It established a Reclamation Fund from the sale of public land. The money collected was directed towards constructing and maintaining irrigation projects in the western states. The fund was to be maintained as a revolving fund with settlers making repayment, without interest, over a ten year period. It preserved the Federal Government's right to withdraw land from homestead for irrigation works. It also stated that ownership would remain with the government even after the project payments were completed. Publicly irrigated lands were to be settled under the homestead laws on tracts of land between 40 and 160 acres. The idea was to promote family instead of corporate farming. Privately owned land

irrigated by federal projects had to have the landowner living on or "in the neighborhood of such land." No landowner could receive water on more than 160 acres. It also stated that the water rites obtained by the Federal Government for water projects could not interfere with state laws regarding water appropriation.

Proponents of federal irrigation made two basic arguments. The first was that irrigation of the western states was needed to encourage western settlement. The second was that the irrigation projects represented large-scale undertakings which were simply too risky for smaller associations. (Ref. 12:p. 25)

The first argument is difficult to make since population growth in the western states was unabated during this time period. As the table indicates, between 1860 and 1900 there was a population explosion in the western states, with a 558 percent increase in population. Population increased 133 percent in all other regions during the same time period. This growth occurred before the Federal Government committed one dime to the Bureau of Reclamation for the development of water projects. Growth in the population of the western states continued after 1900, with an increase of 242 percent between 1900 and 1940. During this same time period, the remaining regions grew by only 64 percent. Between 1860 and 1900 the western population growth rate outpaced the rest of the country by a ratio of 4.2 to 1. Between 1900 and 1940, after the development of a federal irrigation program specifically designed to promote western development, this ratio dropped to 3.8 to 1 (see Table 2). This is not to suggest that early irrigation projects hampered population growth in the west. It is only to point out that the western states

were experiencing rapid growth even before the advent of federal irrigation projects. This puts the stated need for these projects into question.

REGIONAL POPULATION TRENDS FROM 1860 TO 1940

YEAR	WEST	SOUTH	NORTH EAST	CENTRAL
1860	618	11085	10593	9092
1880	1767	16611	14509	17365
1900	4065	24446	21004	26279
1920	8875	33075	29632	33979
1940	13883	41665	35976	40143

TABLE 2 (Ref. 1:p. 22) (thousands)

The second point meets two challenges. If an undertaking is too risky for smaller private firms, this might indicate that the risks are also too high for government intervention with the tax payers money. Furthermore, private irrigation was taking place all over the western states, as Tables 3 and 4 indicate.

As Table 3 indicates, the high water mark for the Bureau of Reclamation occurred in 1969, with just over 24 percent of the irrigation projects being funded by federal funds. And Table 4 shows that the national average for all BOR irrigation projects is about 18 percent of the total. Of the 18 percent, some projects could have attracted private investment and have been developed outside of the public trough. The imperative for federal involvement is questionable when over 85 percent of all projects either had been or could have been privately developed. Whether it was wise to construct the remaining 15 percent will be addressed later.

LAND IRRIGATED BY BUREAU OF RECLAMATION PROJECTS IN THE SEVENTEEN WESTERN STATES

YEAR	TOTAL ACRES IRRIGATED (1YR)	ACRES IRRIGATED BY BOR	PERCENT IRRIGATED BY BOR
1890	3631	0	0%
1900	7527	0	0%
1910	14025	473	3.4%
1920	18593	2205	11.9%
1930	18948	2791	14.7%
1940	20395	3391	16.6%
1949	24261	5077	20.9%
1959	30741	6803	22.1%
1969	34804	8576	24.6%
1978	43627	9576	21.9%

TABLE 3 (Ref. 12:p. 17) and (Ref. 13:p. 32) (thousands of acres)

LAND IRRIGATED BY BUREAU OF RECLAMATION PROJECTS (1977)

STATE	TOTAL ACRES IRRIGATED	ACRES IRRIGATED BY BOR	ACRES IRRIGATED BY BOR
Arizona	1211	337	28%
California	8604	2757	32%
Colorado	3458	866	25%
Idaho	3508	1493	43%
Kansas	2686	60	2%
Montana	2086	349	17%
Nebraska	5698	471	8%
Nevada	899	133	15%
New Mexico	904	215	24%
North Dakota	141	29	20%
Oklahoma	602	44	7%
Oregon	1920	467	24%
South Dakota	341	75	22%
Texas	7018	246	4%

Utah	1185	330	28%
Washington	1681	901	54%
Wyoming	1685	355	21%
subtotal	43627	9128	21%
other states	7211	4	0%
TOTAL	50838	9132	18%

TABLE 4 (Ref. 12:p. 24) (thousands of acres)

Once the decision was made in favor of federal involvement, it did not take long before the revolving fund policy for financing the Reclamation's Fund became stuck. As farmers took advantage of the irrigation projects, some began to experience financial difficulties. It was argued that additional federal assistance should be provided to financially troubled farmers on federal projects (see Table 5). This was justified in terms of "protecting the

INTEREST SUBSIDY/RATE OF DISCOUNT

Payment Plan	3%	6%	10%
10 yrs/equal installments	14.7	26.4	38.6
20 yrs/equal installments	25.5	42.5	57.5
20 yrs/graduated installments	28.9	47.8	64
20 yrs/graduated installments/grace period/down payment	30.7	50.3	66.7
40 yrs/equal installments	42.3	62.5	75.5
40 yrs/eqaul installments/10 yr grace period	57	79	91

TABLE 5 (Ref. 14:p. 53)

federal financial investments and the commitments of purpose that had already been made (Ref. 12:p. 25)." This opened up a flood gate of federal expenditures and involvement. The notion of sunk costs were apparently of no consideration in the decisions made during this time period.

In 1914, Congress enacted the Reclamation Extension Act, which extended the repayment period from 10 to 20 years (Ref. 12:p. 29). It also provided for a graduated repayment schedule. Five percent of construction costs were repaid in each of the first five years; seven percent was repaid each year thereafter. For settlers on existing projects, repayment was extended 20 years from the date of the act. Two percent of construction costs had to be repaid in each of the first four years, four percent in the next two years, and six percent in the remaining 14 years. The act also included certain penalties for late payment. A one percent penalty would be levied on all payments more than three months late. Water would also be cut off to land for payments which were more than one year delinquent.

Even with this reform, payments continued to be a problem. The Secretary of Interior was authorized to continue water deliveries to settlers in 1921, 1922 and 1923, even if the settlers were more than one year behind in repayment (Ref. 12:p. 29). It was also decided that after showing "hardship", capital and operation and maintenance charges could be deferred for a two year period. The capital charges deferred during this period would carry a six percent interest charge. However, repayment could be amortized over the remaining repayment period, reducing the overall burden of repayment. A similar act was

passed in 1924, which provided deferrals through 1927. In 1926, the secretary was given the authority to defer payment for yet another five years, and to defer the repayment of construction charges on whatever schedule he found necessary.

The "Fact Finders Act" of 1924 allowed for further repayment modifications. It let the Secretary of the Interior assess different charges against different classes of land in the same project to achieve an "equitable apportion" of repayment according to the lands productive value (Ref. 12:p. 31). It also established repayment as five percent of the average gross income per acre, although this part of the act was repealed in 1926.

Further repayment deferrals occurred during the Great Depression (Ref. 12:p. 31). Repayment was deferred for one year in 1932 and reduced by 50 percent. The remaining 1932 repayments, along with the 1933 charges were again deferred in 1933 and 1934. Charges were once again reduced by 50 percent in 1936. Given the longevity of these deferrals, there were some settlers who made no payments at all between 1921 and 1936. Despite this generous payment policy, payments were still a problem. In 1939, the Reclamation Project Act was passed (Ref. 12:p. 32). This act allowed for deferrals of repayment for up to 10 years after a project was completed. This act led to what amounted to a universal policy of allowing all future projects a ten-year development period during which no repayments had to be made.

There are other indirect subsidies used within the irrigation network. One such subsidy resulted from the Colorado Basin Salinity Control Act of 1974. The act established a salinity control plant and directed that 25 percent of the costs of the program should be

repaid without interest over a 50 year period from moneys in the Colorado River Basin funds (Ref. 12:p. 43). Total expenditures at the salinity plant are estimated at between $1.5 and $4 billion. The repayment terms of the act will result in less than six percent of the total cost being repaid. Because of this, part of the cost will have to be viewed as a partial subsidy since irrigation is a significant beneficiary of the salinity control program. It should also be noted that about 37 percent of the salinity found in the Colorado River is attributable to irrigation.

Another indirect subsidy came in the form of the Reclamation Safety of Dams Act, passed in 1978. The act allows for the allocation of $100 million to finance projects to enhance dam safety (Ref. 12:p. 44). In 1984, this was increased to $650 million because the Bureau of Reclamation's list of dam safety modifications had a cost estimate of $705 million.

B. CURRENT INEFFICIENCIES

In discussing the current inefficiencies associated with federal irrigation policies, it is clear that the primary effect has been agricultural migration. It did contribute to the objective of western migration. The question is, was the policy worth the costs? The overall outcome is that agricultural land in the Midwest and South has been laid to rest or never developed in favor of irrigated land in the West (Ref. 12:p. 46). This has resulted in a shift from regions with relatively high rainfall to very arid regions. This is obviously not an efficient farming practice. One of the most outrageous example is that cotton grown in irrigated deserts now competes with cotton grown in the South (Ref. 12:p. 46). As Table

6 indicates, the southern California desert has an evapotranspiration (ET) rate of 82.8. This is not an ideal climate for agriculture. Nor is cotton, with an ET rate of 31 (see Table 7), particularly well suited for this environment. These policies have led to an inefficient use of land, water, capital, and labor.

ANNUAL POTENTIAL EVAPOTRANSPIRATION RATES IN CALIFORNIA

Region	Annual Evapotranspiration Rate
North Coast	26.1
Central Coast and Interior Valleys	48.3
Southern Desert	82.8

TABLE 6 (Ref. 14:p. 91)

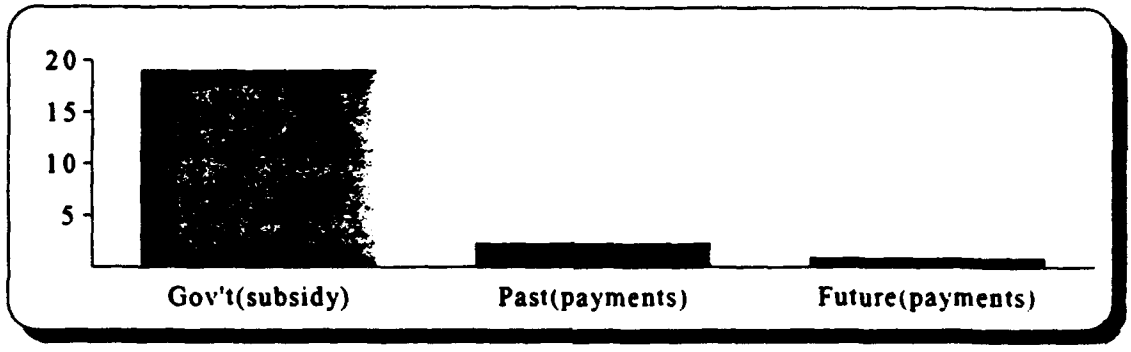
EVAPOTRANSPIRATION OF MAJOR CROPS IN THE SAN JOAQUIN VALLEY

Crop	Growing Days	Total ET(in.)
Small Grains	200	13
Beans	120	21
Grain Sorghum	150	24
Corn	150	27
Cotton	180	31
Sugar Beets	210	36
Rice	150	39
Table Grapes	270	40
Alfalfa	All Year	48

TABLE 7 (Ref. 14:p. 92)

Of the $22.2 billion dollars ($1,920 per acre) that had been spent on construction projects up to 1986, only 10 percent has been repaid (see Figure 6). Clearly the programs are not self sufficient, and any hint of a "revolving fund" has long since vanished. This is further born out by fact. Of the 3,276,296 acre-feet of water delivered for the California

Central Valley Project, only 16 percent of it is paid for in full by the users. This project alone is subsidized by $5,046,675 a year (1986 dollars). (Ref. 12:p. 58)



Irrigation Construction Costs Subsidy on All Projects (1986)
Figure 6 (Ref. 12:p. 38) (billions of dollars)

Another related problem deals with the users "willingness" to pay. Only 14 percent of the publicly irrigated land has increased in value enough to justify the costs of its respective irrigation project (Ref. 12:p. 35-40). Assuming agricultural land values equal the present value of their future expected net operating profits, the benefits of irrigation outweigh the costs for only 14 percent of all federal expenditures on irrigation. This 14 percent doesn't take into account opportunity costs. For this reason, the actual percentage of revenue actually invested wisely is probably substantially lower.

Another problem generated by irrigation is a growing population with an increasing appetite for water (see Table H). About 90 percent of the water used in the western states is used for agriculture. This low cost, subsidized water has certainly not encouraged careful use of the resource. By heavily subsidizing water we have created what amounts to "*common*" vice "*public*" water rights. Common ownership will always result in shortages and overuse since the costs of an item will always be lower than its market

value. The Europeans experimented with common ownership of timber until timber reserves became virtually depleted in many areas.

There are two ways to eliminate the inefficient use of common property. It can be privatized or made public. Directing water away from agriculture and towards users willing to pay market value should serve as an economic stimulant to the entire region. It could immediately generate large water surpluses in many of the current drought areas. If agricultural use of water along the Colorado river were to be reduced by just five percent, it would double the available water for both municipalities and industries (Ref. 14:p. 129).

WATER WITHDRAWAL AND CONSUMPTION

YEAR	TOTAL WITHDRAWAL	TOTAL CONSUMPTION
1960	270	61
1965	336	77
1970	370	88
1975	393	107
1985	422	121

TABLE 8 (Ref. 13:p. 2) (billions of gallons)

It should also be noted that significant amounts of hydropower on reclamation projects are dedicated to pumping irrigation water. Hydropower is provided at a very low cost because of an interest free subsidy for irrigation pumping. This results in relatively inexpensive hydropower being diverted from other productive enterprises to irrigation pumping. The Bureau of Reclamation has even found it necessary to construct thermal power plants for the pumping requirements of water projects. Table 9 displays the power subsidy which is directed towards irrigation. During a time when water and energy are in short supply, there is no shortage of alternate and more profitable uses for hydropower.

POWER SUBSIDY FOR IRRIGATION

PROJECT	COSTS ALLOCATED TO IRRIGATORS ($)	COST PAID BY IRRIGATORS ($)	SUBSIDY
Central Valley California	682,152,000	606,646,000	11.1%
Chief Joseph Dam Washington	11,083,200	6,050,000	45.4%
Collbran Colorado	6,105,000	1,089,101	82.2%
Columbia Basin Washington	745,111,398	135,916,400	81.8%
Fryingpa- -Arkansas Colorad	69,946,000	50,512,300	27.8%
Rouge River Oregon	18,064,000	9,066,500	49.8%
San Angelo Texas	8,853,904	4,000,000	54.8%
The Dallas Oregon	5,994,000	2,550,000	57.5%
Ventura River California	18,273,128	10,746,300	41.2%
Washita Basin Oklahoma	10,403,011	8,221,000	21.0%

TABLE 9 (Ref. 13:p. 51)

C. OTHER AGRICULTURAL SUBSIDIES

Finally, it should be noted that subsidized water is often used to irrigate subsidized crops. Over $17.2 billion in 1991 was spent by the Department of Agriculture (DOA) in the form of farm income stabilization and agricultural research and services (this figure does not include water subsidies). Total DOA expenditures exceeded $60 billion. In 1989, the Department of Agriculture had a total budget of $48.3 billion, which translated into an average expenditures of about $16,870 per farm employee. Not all Department of Agriculture expenditures represent a direct subsidy to the farmer in the form of farm income stabilization or agricultural research and services. Two of the biggest remaining

funding items are directed towards Department personnel and the Food Stamp Program. However, these are indirect subsidies since these expenditures benefit the farmer, though the exact benefit is difficult to estimate. Clearly, it is difficult to find any aspect of farming that does not reach into the taxpayers' pockets.

The following federal programs are targeted specifically at agriculture: price support loans; direct payments (e.g., deficiency payments and diversion payments); crop disaster relief; emergency livestock forage assistance; federal purchases; producer storage payments; processing storage and transportation; operating expenses; interest expenditures; and export programs. This does not represent a complete listing, but it does cover the major programs. (Ref. 15:p. 654)

Between 1984 and 1990, cotton farmers alone received direct government payments of $6,176 million. Total crop value during this same time period was $29,741 million, which amounts to a subsidy of over 20 percent (Ref. 15:p. 651). Part of this subsidy involves federally guaranteed loans for an income stabilization program carried out by the Commodity Credit Corporation (CCC). This represents a substantial subsidy. Not only are these loans made at a below market rates, but once a farmer enters into a loan agreement they are able to sell their crop to the government at a pre-established price (Ref. 16). This price is almost always greater than the going market price, and never below it since farmers have the option of pulling out of the loan and selling in the market. This price stabilization policy is not only paid for by the tax payers, but also by the consumers in the form of higher prices. Once a commodity is taken out of the market

place for sale to the government, the supply is reduced, thereby increasing the market price.

Direct payments to cotton farmers alone do not reflect the true amount of the subsidy since the Competitiveness Provision of 1990 is not included in these estimates. The Competitiveness Provisions provides additional subsidies to mills when the domestic price of cotton falls 1.25 cents below the global price (Ref. 17). This subsidy can be substantial. It reached about 200 million in 1993. The consumers have also been forced to pay higher prices for cotton due to tariffs associated with cotton imports. The current tariff rate on imported cotton is four cents per kilogram. The greatest price paid by consumers in terms of import restrictions comes in the form of import quotas on cotton. Only 30,000 bails of short stem cotton and 95,000 bails of long stem cotton can be imported (Ref. 17). Current domestic production is about 500,000 bails, most of which is exported. So cotton growers can be subsidized through a variety of programs which include water subsidies, production subsidies in the form of "income stabilization", export subsidies in the form of the "Competitiveness Provision" of 1990, transportation subsidies in the form of "value of commodity" pricing regulations for railroads in addition to other federal transportation subsidies, and protection from foreign producers in the form of both tariffs and import quotas.

D. CONCLUSION

In conclusion, the simple questions must be asked. Was the policy needed to generate migration westward, was the policy needed to insure western economic development, and did the benefits of the policy outweigh the costs?

The policy did accelerate migration westward during the earlier years. However, western migration had been a growth industry long before the Federal Government got involved in irrigation. In fact, the policy probably exceeded its objectives as indicated by the shift in agriculture from the moist midwest and south to the arid southwest (e.g., cotton). In perhaps the greatest twist of irony, a policy whose initial justification was to encourage expansion westward is now proving to be one of the greatest hindrance to western economic growth, given the strain on existing water supplies. The costs of the policy has certainly exceeded any imagined benefit. Aggregate utility has been reduced by an inefficient use of resources through the transfer of both labor and capital into an industry which is sheltered from market disciplines. And by opting to pay more for agricultural products than the market would otherwise dictate due to price stabilization programs we experience opportunity costs resulting in an inability to buy other commodities.

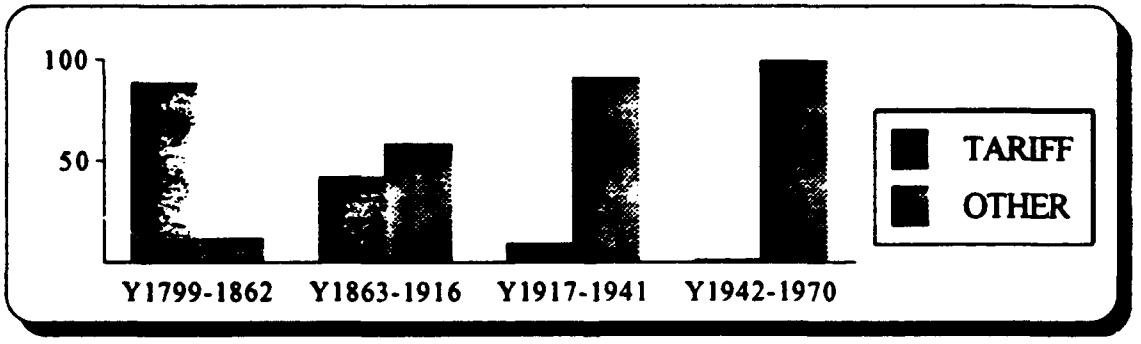
Federal irrigation policy is just one more example of a federal program for which the sun never set. This kind of policy longevity is perhaps the greatest danger of any industrial policy. It also shows, as in the case of the railroads, how a select group can co-opt the power of government to advance their own financial interest at the expense of

others, and the economy as a whole. These concerns raise the following questions: If a bad policy is enacted, or if a good policy has outlived its usefulness, is there anyway to get rid of it within the political realm? And given this, do the benefits of a policy, even a good one, outweigh the potential long term loses?

IV. TARIFFS

A. HISTORICAL OVERVIEW

Perhaps the most influential industrial policy to be implemented prior to 1918 was tariffs to shelter American corporations from foreign competition. The following section will be a macro overview of tariff rates and their effect on the economy as a whole. Although tariff policy continued to play an important role in the economy after 1918, their effect on the economy was limited due to the growth in other revenue sources. Figure 7 shows the declining trend of customs revenues as a percentage of total revenues. After the Civil War, internal revenues began to equal customs revenues. Prior to this, customs accounted for over 88 percent of all revenues. It is for this reason that the pre-Civil War period allows for the most accurate testing of the effects of tariff policy.



Tariffs as a Percentage of Total Revenues 1799-1970
Figure 7 (Ref. 1:p. 1105-1106)

TARIFFS ENACTED BETWEEN 1857 and 1913

DATE	NAME	AVE DUTIABLE	AVE TARIFF RATE
1857		22%	19%
1862	Morrill	36%	26%
1865	War	48%	38%
1873		39%	28%
1876		44%	31%
1883		42%	30%
1891	McKinley	47%	26%
1895	Wilson-Gorman	42%	20%
1897	Dingley	50%	25%
1910	Payne-Aldrich	41%	21%
1915 (1918)	Underwood-Simmon	33% (24%)	12% (6%)

TABLE 10 (Ref. 3:p. 392)

Tariffs have been used as a means to generate revenues since Colonial times. However, the tariff was first considered as a instrument of protection in 1816 (Ref. 18:p. 139). At the conclusion of the Napoleonic wars, Thomas Jefferson feared that cheap manufactures from Europe would wipe out upstart industries in the United States. This would pose a direct threat to our national independence. "To be independent for the comforts of life we must fabricate them ourselves. We must now place the manufacturer by the side of the agriculturist.... Experience has now taught me that manufacturers are now as necessary to our independence as to our comfort (Ref. 19:p. 178)."

In 1828, the northern states pushed through tariff legislation designed to "protect" their own industrial interest, much to the disgruntlement of the largely agrarian South. The southern legislatures referred to the Act as the "Tariff of Abominations." The tariff was allowed to lapse in 1832, after southern states threatened succession, but the political battle between North and South over tariffs continued until after the Civil War. (Ref. 18:p. 216)

The highest free and dutiable average tariff rate occurred in 1830, with an effective tariff rate of 57 percent. Between 1834 and 1861, free and dutiable rates averaged about 20 percent (Ref. 1:p. 888). The Republican Party came to power in 1861 committed to a policy of higher tariffs. The Civil War provided an ideal opportunity to increase rates to generate revenues for the war effort. In 1865, free and dutiable average rates reached a high of 38 percent, while rates exclusively on dutiable goods went as high as 47.56 percent.

As the war came to an end, tariff policy shifted from revenue generation to sheltering and protecting certain American industrial and agricultural interests from foreign competition. This represented the most significant and broad based attempt by the Federal Government to influence industrial development; it has remained the tool of choice to this day. Duties were placed on such items as tea, coffee, coal, iron, wool, paper, and a number of other commodities. Despite the increase in tariffs which occurred during this time period, imports continued to pour in. The additional costs were passed on to the consumers in the form of higher prices. These high tariffs began to produce budget

surpluses. This forced Congress to reduce the average tariff rate on dutiable goods from 48 percent to 39 percent, between 1870 and 1872.

The economic down turn of 1873 resulted in a decrease in consumer spending, and hence tax revenues. This provided the excuse needed to push rates back up. By 1875, dutiable rates were back up to 44 percent, a level just below the Civil War average.

In 1882, a Tariff Commission headed by John L. Hayes, secretary of the Wool Manufacturers' Association, was established to advise Congress on future tariff policies. The commission was stacked with protectionists. However, public opinion was beginning to turn against high tariffs and the commission took action which reduced the tariff burden by 20 percent, to an average dutiable rate of 40 percent. John L. Hayes stated that the policy was "a concession to public sentiment, a bending of the top and branches to the wind of public opinion to save the trunk of the protective system." The new act lowered rates on pig iron, steel rails, copper and other commodities, and raised rates on certain classes of woolens, specific cotton goods and certain steel manufactures. It is interesting to note that the textile industry was treated very kindly by this commission, no doubt attributable to the influence of Mr. Hayes.

After Grover Cleveland, who campaigned as a free trader, was elected to the Presidency, trade policy remained protectionist due to a Republican majority in Congress. A bill reducing tariffs was introduced by Rep. Roger Q. Mills of Texas early in 1888. After extensive debate it passed the House, only to be killed in the Senate where

protectionist sentiment was strongest. President Cleveland was defeated by Benjamin Harrison in 1889. With his defeat, the first serious attempt to change tariff policies ended.

President Harrison was eager to increase tariff levels to further insulate domestic producers from foreign competition. In 1890, he did exactly that by enacting the McKinley Act. The average tariff rate on dutiable goods was increased to 48 percent. The textile industry was once again one of the prime beneficiaries of the new act. The tariff on cotton manufacturers went from 35 to 50 percent, on cotton cords from 35 to 60 percent, and on linen laces from 30 to 60 percent.

The McKinley Act also abolished the tariff on sugar. This was done to eliminate another revenue surplus brought about by the higher tariffs. However, the farmers were reimbursed with a two cent per pound subsidy to compensate for the elimination of the two cent a pound tariff on imported sugar. This became the first in a long list of agricultural subsidies.

The McKinley Act was also unique in that it gave the President authority to proclaim duties on certain non-dutiable imports to retaliate against countries imposing unreasonable or unjust duties on American exports. This part of the act was directed primarily against our South American trading partners.

Grover Cleveland was re-elected to the Presidency in 1892. Free traders were hopeful that he would be able to accomplish the tariff reductions in his second term that he had failed to do in his first. President Cleveland passed the Wilson-Gorman Act, which reduced the average dutiable tariff downward from 48 to 41 percent. Rates on wool were

removed altogether. However, the overall rate reduction package was a disappointment. In fact, sugar was placed back on the tariff list. President Cleveland was only able to put a dent in existing tariffs. McKinley's re-election to the Presidency reversed what limited progress had been made.

In 1897 the Republicans passed the Dingley Tariff. It raised the average dutiable rate to 50 percent. Wool was once again placed on the tariff list and rates on silk, linens, chinaware, and a number of other commodities were increased.

The Dingley Tariff was followed by the election of William H. Taft and the Payne-Aldrich Tariff in 1909. The tariff was initially intended to reduce rates, but the Senate once again insured that any change would be only marginal in nature. As a result of this act, the average dutiable rate was reduced from 50 to 41 percent.

When the Democrats once again reclaimed the White House under Woodrow Wilson, another attempt was made to reduce tariffs. The Underwood-Simmons Act was designed to reduce tariff rates by about nine percent, with wool and many additional items being placed on the free duty list. The act maintained duties only on "legitimate industries." By 1915, the average dutiable tariff rate was reduced from 41 to 33 percent, and by 1918 it dropped to 24 percent. The average free and dutiable rate was reduced to 5.79 percent. This represented the lowest average dutiable rate since 1857, and the lowest average free and dutiable rate to date.

This rate reductions from the Underwood-Simmons Act were significant. However, it was also during this time period that the corporate and personal income tax became

significant sources of federal revenue. Although Democrats reduced tariff rates on foreign businesses, they increased internal taxes at home. The total per capita tax rate jumped from under two percent in 1917 to almost five percent in 1918, reaching a high of eight percent in 1921. Much of this revenue was raised to fund the war effort. So the drop in tariff rates did not accurately reflect the aggregate tax burden at the time.

By the end of World War I, both political parties had developed similar positions on tariffs, with disagreements centering only on the degree of protection that should be provided. Republicans had softened their original hard line stance and Democrats had abandoned their free trade position.

TARIFFS ENACTED AFTER 1913

DATE	NAME	AVE DUTIABLE	AVE TARIFF RATE
1921	Emergency Tariff Act	29.46%	11.44%
1922	Fordney-McCumber	38.07%	14.68%
1930 (1932)	Smoot-Hawley Act	44.71% (59.06%)	14.83% (19.59%)
1939	Reciprocal Trade Act	37.33%	14.41%
1947	GATT (Geneva)	19.34%	7.55%
1949	GATT (Annecy)	13.46%	5.53%
1951	GATT (Torquay)	12.26%	5.47%
1956	GATT (Geneva)	11.30%	5.67%
1960	GATT (Dillion)	12.22%	7.40%
1964	GATT (Kennedy)	11.58%	7.20%
1973	GATT (Tokyo)	N/A	5.00%
1990	GATT (Uruguay)	N/A	3.30%

TABLE 11 (Ref. 20:p. 4)

The Emergency Tariff Act of 1921 was the first in a series of new Republican tariffs. This tariff was primarily created to protect American farmers. After World War I, the

Europeans restored their agricultural production to pre-war levels, thereby reducing the wholesale prices of American farm goods. It was hoped that the tariff would help to stabilize domestic agricultural prices, but the act failed. This failure was due largely to the high productivity and competitive nature of the domestic industry.

The Fordney-McCumber Act of 1922 helped shore up the Emergency Tariff Act of 1921. The new act made the higher rates on agricultural imports permanent, and raised many of those rates above the 1921 levels. This was one of the most inclusive tariffs ever passed, extending protection to almost every domestic industry. Duty free imports declined from $3,116 million in 1920, to $1,564 million in 1921 (Ref. 1:p. 888). Dutiable imports also declined from $1,986 million in 1920, to $993 million in 1921, due to the increase in the average dutiable rate from 16.4 percent to 29.46 percent (Ref. 1:p. 888). The act also gave the President the authority to increase tariffs by executive order on any commodity in need of additional protection. The tariff's objective was to "equalize production costs" between American and foreign industries. The past veil of tariffs as an instrument of retaliation against unfair trade practices was now being lifted in favor of outright protection.

The last of the big tariffs passed by Republicans was the Smoot-Hawley Act of 1930. It was the agricultural bloc in the Senate that once again pushed rates upward on agricultural goods. It increased some rates on manufactured imports, but it was dominated by agricultural interest. Under Smoot-Hawley, duty free imports declined from $2,880 million in 1929, to $886 million in 1932 (Ref. 1:p. 888). This decline partly reflected the

depression, but also included the transfer of items from the duty free list to the dutiable import list. Dutiable imports also declined from $1,458 million in 1929, to $440 million in 1932, due in part to the increase in the average dutiable rate from 40.1 percent to 59.06 percent (Ref. 1:p. 888). Although per capita GNP declined by 31 percent during this time period, both duty free and total imports were reduced by 70 percent (Ref. 1:p. 224).

From this point on, the United Nations sponsored organization called GATT (General Agreement on Tariffs and Trade) was the primary architect of international trade policy. It continues to be so to this day. The initial Geneva round of talks in 1947 reduced the average dutiable and duty free rate to 7.55 percent, from 14.83 percent in 1939. Rates continued to decline to the 5 percent range through subsequent rounds of talks. However, the average rate was increased back up to 7.4 percent in the Dillion round in 1960. The average rate dipped back down to 5 percent in 1973, after the Tokyo round of talks. As of 1990, with the Uruguay round of trade talks, the average tariff rate on free and dutiable goods had been reduced to 3.3 percent.

The GATT process has been both unique and quite successful. It represents the first effort at large scale tariff reductions on an international level. It has helped to reduce the use of unilateral actions, which are usually of a protectionist impulse. At the same time, it has introduced the concept of trade fairness in a meaningful sense. This has proven beneficial not only to large economically developed countries, but also to smaller less developed countries. These countries had often found themselves holding the shorter end

of the trading "stick" when they were forced to participate outside of an organized international body.

B. TREND ANALYSIS

In assessing the effects of tariff policy throughout this time period, it is useful to compile a trend analysis chart. The chart was compiled by analyzing tariff rates between 1799 and 1940. Data is analyzed to find increasing or decreasing rate trends over a period of time and isolate the low and high rate in each trend. Only deviations greater than two percentage points are noted in the chart. The primary advantage of a trend analysis is that you are able to clearly isolate periods of high and low tariffs rates and show the long term trends associated with each. This will serve to screen out the short term trends which will be plagued with lagging indicators, thereby clouding the picture.

Between 1799 and 1940 there were only five periods of declining per capita GNP growth in the trend chart. These declines bottomed out in the years 1829, 1869, 1893, and 1933 (see Table 12). Table 12 indicates these rates of decline.

The declines in annual per capita GNP that occurred in 1829 and 1869 are clearly attributable to the excessive average free and dutiable tariff rates, which peaked at 50 percent and 44 percent, respectively. The decline of 1829 was the most severe we have experienced. It represented a 30 year decline in our standard of living, and it took over 40 years for per capita GNP adjusted for inflation to regain its 1799 level.

TREND ANALYSIS CHART(> 2% points deviation)

YEAR	AVE TARIFF RATE	PERCAP GROWTH RATE
1799	8.37%	
1829	50.73%	-0.8%
1839	17.57%	2.06%
1849	23.41%	1.88%
1859	15.43%	2.59%
1869	44.76 %	-1.99%
1892	21.65%	3.8%
1893	23.91%	-6.63%
1895	20.44%	2.39%
1899	29.48%	2.78%
1905	23.77%	2.48%
1918	5.79%	2.16%
1923	15.18%	0.15%
1933	19.8%	-2.4%
1940	12.51%	7.54%

TABLE 12 (Ref. 1:p. 224) and (Ref. 21:p. 130)

The decline of 1893 was no doubt aided by the McKinley tariff of 1890, which raised the 1892-94 average dutiable rate to about 50 percent. This was the highest average dutiable rate since 1830. Although the average free and dutiable rate actually declined during this time period, this decline in rates did not accurately reflect the economic effect of the tariff. This will be explained in greater detail later.

The second most significant decline occurred in 1933. The decline of 1933 drove per capita GNP down to its 1903 level. The severity of the down turn was aided by a number of factors. The first factor was the increase in the average free and dutiable rate from 5.79 percent in 1918 to 19.59 percent in 1932. The average dutiable rate also increased during this same time period from 23.56 percent to 59.06 percent, once again the highest since

1830. Both the Fordney-McCumber and Smoot-Hawley tariffs contributed to this downfall. Although the average free and dutiable rates had been higher prior to 1911, and at times much higher, the effects of these tariffs proved to be far more severe for two basic reasons. First, our dependence on imports was substantially less prior to Underwood-Simmons tariff of 1913. This act lowered the average rate to an all time low of 5.79 percent in 1918, resulting in a flood of imports into the economy. In just a five year period from 1915 to 1920, imports increased from $1,648 million to $5,102 million, an increase of over 200 percent. After tariffs jumped back up in 1921, imports dropped to $2,577 million, and fell still further to $1,325 million in 1932. Secondly, average free and dutiable rates were under represented due to the substitution effect between imports and domestic goods brought about by the excessively high dutiable rates. This is the same phenomena that occurred in 1893.

C. GROWTH RATE ANALYSIS

As mention earlier, the significance of tariff rates in influencing macroeconomics events was very much dependent upon the time in which they were studied. This was due to the change in the percentage of total revenues represented by customs duties. Because of this, the following growth rate analysis was divided up into three distinct time frames: 1799 to 1859; 1860 to 1905; and 1906 to 1941.

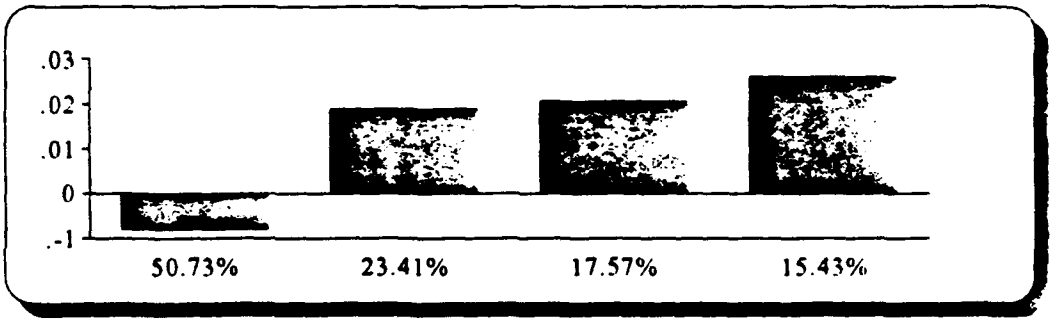
The period from 1799 to 1859 represents the purest time frame. During most of this period the tariff was the exclusive source of revenue. This allowed for a more accurate cause and effect relationship between tariff rates and other economic indicators. There

does seem to be a strong inverse relationship between tariff rates and per capita income growth during this time period, as represented by the following trend charts. Table 13 represents the relationship between peak and trough tariff rates and per capita GNP. Figure 8 displays the correlation between peak and trough tariff rates, and per capita GNP growth rates.

TREND CHART FROM 1799 TO 1859

YEAR OF TREND CHANGE	AVERAGE TARIFF RATE	PER/CAP GNP(58 $)
1799	8.37%	448
1829	50.73%	340
1839	17.57%	410
1849	23.41%	487
1859	15.43%	613

TABLE 13 (Appendix B)



Average Annual Growth Rate in Trend From 1799 to 1859
Figure 8 (Appendix B)

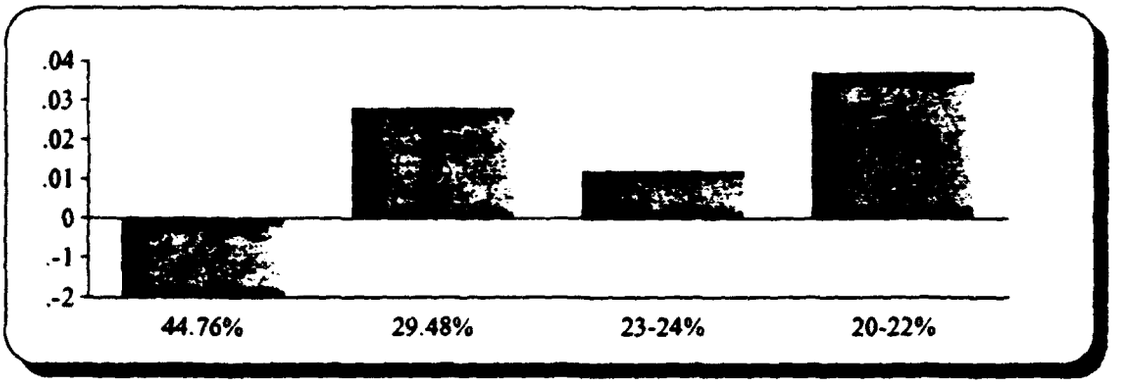
During the period from 1860 to 1905, tariff revenues accounted for about 41 percent of total revenues. There is also a visible inverse relationship between per capita income and tariff rates during this time period, until you get to the 23-24 percent column (see Table 14 and Figure 9). At this point, growth actually drops off by about 1.6 percent annually. This

reduction in growth is attributable to both the McKinley Tariff Act of 1890 and the growth in the number of non-dutiable goods. The act increased tariff rates on dutiable goods from 44 to 50 percent within a four year period from 1890 to 1894. The effect was even more exaggerated since the increases were targeted at only a few commodities, resulting in a 30 percent increase in most imported textiles or textile products. This decreased imported dutiable goods from $508 million in 1890 to $258 million in 1894 while the importation of duty free goods increased form $258 million to $372 million during the same time period. This was the lowest level of imported dutiable goods since the Civil War. This gave the illusion of a tariff reduction when viewing the average rates of dutiable and duty free goods combined. However, the real effect was to force consumers to buy the more expensive textiles made in the United States, amounting to a hidden tariff or tax.

TREND CHART FROM 1869 TO 1899

YEAR OF TREND CHANGE	AVERAGE TARIFF RATE	PER/CAP GNP(58 $)
1869	44.76%	491
1892	21.65%	920
1893	23.91%	859
1895	20.44%	900
1899	29.48%	1000
1905	23.77%	1149

TABLE 14 (Appendix B)



Average Annual Growth Rate in Trend From 1860 to 1905
Figure 9 (Appendix B)

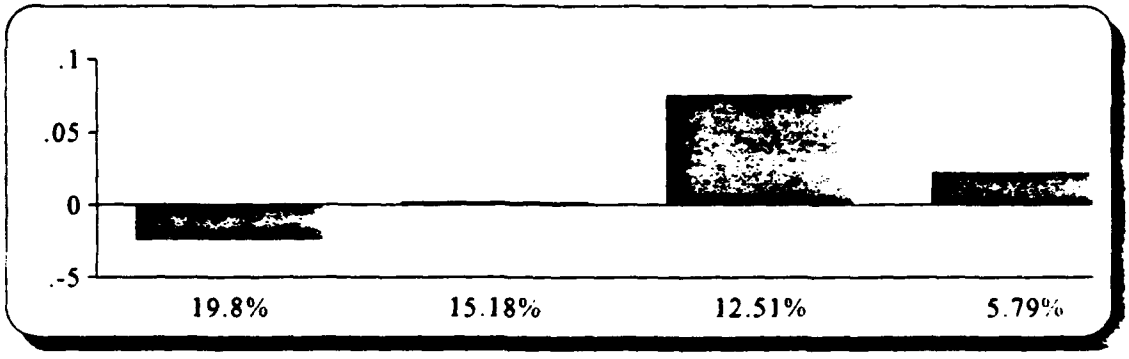
As an example of this distortion, consider two commodities, A and B, which each represented 50 percent of all imports. Assume that commodity A was a duty free import and commodity B had a tariff rate of 10 percent. Your average tariff rate would be five percent. Now assume that commodity A remains duty free but commodity B has its tariff increased to 100 percent to protect domestic producers from "unfair" competition. The new tariff on commodity B results in a drop in its import share from 50 to zero percent. The net result would appear to be a reduction in the average tariff rate to zero percent, since commodity A is the only import remaining. However, the economic effect of this new tariff would be added consumer costs in the form of higher prices for commodity B. This distortion was not a significant factor in earlier measurements. The number of duty free goods as a percentage of total imports was substantially smaller prior to 1873 and the tariff rates on dutiable goods were lower, creating less of a tax differential between imports.

The final time period, covering 1906 to 1941, continued this trend, with the exception of the 5.79 percent trough (see Table 15 and Figure 10). This tariff range was only experienced briefly in 1918. However, during this period corporate and personal income tax rates were increased substantially, resulting in an overall tax increase that more than offset the potential positive effects of tariff reductions. Tariff revenues as a percentage of total revenues dropped to about nine percent.

TREND CHART FROM 1918 TO 1940

YEAR OF TREND CHANGE	AVERAGE TARIFF RATE	PER/CAP GNP (58 $)
1918	5.79%	1471
1923	15.18%	1482
1933	19.8%	1126
1940	12.51%	1720

TABLE 15 (Appendix B)



Average Annual Growth Rate in Trend From 1906 to 1941
Figure 10 (Appendix B)

D. REGRESSION ANALYSIS

Selected data between 1799 and 1909 was subjected to regression analysis to determine if a relationship existed between a change in tariff rates and per capita income growth. The data used in the regression was represented by a ten year average of annual

compilations after 1889, and within ten year increments during the earlier time periods. Between 1799 and 1889, GNP figures were only available in ten year increments. The data was taken from Commerce Department data (see Appendix B). With R Squared being 0.85 (see Table 17), there does appear to be a strong inverse relationship between a change in tariff rates and per capita income growth.

REGRESSION ANALYSIS OF TARIFF RATES/PERCAP GNP 1799-1909

			t Statistic	P-value
Multiple R	0.92	Intercept	-6.69	3E-05
R Square	0.85	Year	7.05	2E-05
Adj R Square	0.81	Tariff Rate	-2.43	0.03
Standard Error	107			
Observations	12			

TABLE 17 (Appendix B)

Throughout most of the time period covered, there appears to be an inverse relationship between tariff rates and per capita income growth. During this period, tariff rate changes can be isolated as a variable and tariffs represent a significant portion of total federal revenues. This pattern was supported both by the trend analysis data and the regression study. The argument may be advanced that tariff rates were simply linked to revenue needs. This would create a situation in which an economic expansion would be followed by an increase in revenues which would lead to a lowering of tariff rates in order to prevent budget surpluses. In effect, economic conditions would determine tariff rates rather than the reverse. This represents a "chicken and the egg" type argument. It falls short in three areas.

From 1789 to 1985, federal debt as a percentage of GNP approached zero on only two occasions (1840 and 1859) (Ref. 22:p. 462). Given the historical desire to pay down the federal debt, these are the only two times in which this rational would have led to lower tariffs. Furthermore, there is no noticeable relationship between tariff rates and budget surpluses and deficits. Between 1866 and 1893 when we experienced budget surpluses, free and dutiable rates did go down, but dutiable rates by themselves went up. Between 1920 and 1930 when surpluses were also experienced, both dutiable and free rates increased (Ref. 1:p. 1114) (Ref. 1:p. 1106). Finally, given the legislative lags associated with tariff policies, it seems unlikely that Congress would be able to consistently react to movements in the business cycle in a timely manner, especially considering that these trends were computed on an annual basis after 1889. If a relationship exists between tariff rates and economic growth, it is far more likely that tariff rates effected growth rather than growth determining rates.

The adverse effects of high tariffs on per capita GNP growth can not only be viewed historically, but can also be explained by economic theory. The remainder of this chapter will deal with some of the theoretical arguments surrounding free trade, followed by an assessment of the value of tariffs as an effective instrument in promoting an industrial policy and whether such a policy is even desirable.

E. THEORETICAL OVERVIEW

The theoretical basis for free trade was first advanced by Adam Smith as it related to his utility theory of labor: "What is prudence in the conduct of every private family, can

scarce be folly in that of a great kingdom. If a foreign country can supply us with a commodity cheaper than we ourselves can make it, better buy it of them with some part of the produce of our own industry, employed in a way in which we have some advantage " (Ref. 23:p. 424)

John Stuart Mills was also an early advocate of free trade, but presented two possible exceptions. He believed that the price of a good must reflect its true production costs (monopoly-power-in-trade argument for protection), and that it could be justifiable to use tariffs as a diplomatic weapon to force open the markets of other countries (Ref. 20:p. 25). Jagdish Bhagwati took a similar view to that of Mills. He believed that Countervailing Duties (CVDs) and Anti-Dumping provisions could be justified in order to bring a sense of "fairness" to trading arrangements (Ref. 20:p. 48).

Milton Friedman took issue with these exception.

> The method that we have tried to adopt is reciprocal negotiation of tariff reductions with other countries. This seems to me a wrong procedure. In the first place, it ensures a slow pace. He moves fastest who moves alone. In the second place, it fosters an erroneous view of the basic problem. It makes it appear as if tariffs help the country imposing them but hurt other countries, as if when we reduce a tariff we give up something good and should get something in return in the form of a reduction in the tariffs imposed by other countries. In truth, the situation is quite different. Our tariffs hurt us as well as other countries. We would be benefited by dispensing with our tariffs even if other countries did not. (Ref. 24:p. 73)

This conclusion seems to be supported by both the success of Pax Romana and Pax Britannica. The expansion of free trade during the assent of the Roman Empire and the repeal of virtually all tariffs by the British Parliament in 1815 after the defeat of Napoleon both point to a direct relationship between unilateral free trade and economic growth (Ref.

18:p. 179-191). Britain continued on this course of action in 1843 with the repeal of the Corn Laws (Ref. 18:p. 138).

John Stuart Mills' arguments in support of conditional protection and Bhagwati's support of CVDs and anti-dumping provisions may not be practical even if its merits are sound. Economic decisions are not made in a vacuum. If market failure does occur, as in the example of Monopoly-Power-in-Trade, there is no guarantee that government will be able to correct the failure. Indeed, it may even make the situation worse by introducing new problems into the existing mix. The ability of a political process to implement economic Pareto Improvements depends on the construct and defined self-interest of the political realm itself. As James Buchanan has pointed out within the school of Public Choice, the distinction between the pursuit of the private vice the public good has far less to do with a change in motives, and far more to do with a change in methods (Ref. 25:p. 34-37). Self interests are pursued both inside and outside the "belt way." Given this, protection may well be granted not on the basis of economic rational, but on the basis of who wields the most political power. This has been a very real concern of Murray Wiedenbaum who believes that the day is coming when "the most profitable corporate office will be the Washington office."

The second argument to be made against Mills was made best by Joseph Schumpeter. He believed that the perceived threat from monopolies is highly exaggerated for three basic reasons: first, monopolists are always fearful of potential competition whether they have reason to be or not; second, monopolists will always strive to maximize profits

thereby setting a price which, depending on the elasticity of the good, is usually only marginally higher than the equilibrium price would be in a competitive market; and finally, in a world of rapidly changing technologies, monopolists must be able to compete with potential or existing economic substitutes (Ref. 26:p. 87-106). For example, the railroads must still compete with the trucking, airline, and shipping industries even if a monopoly situation were to exist. For these reasons, monopolies will be forced to maintain a reasonable pricing strategy. If they are willing to maintain prices below their own production costs for an indefinite period of time in order to fend off potential start-up competition, then we should simply thank them for their generosity and divert our capital to other more profitable areas.

As mentioned earlier, there are strong arguments to be made against high tariffs at a macro level as it relates to both utility theory of labor arguments, and the more recent debate over public choice considerations. These policies nurture economic inefficiencies at both the macro and micro level by creating a form of income redistribution among various industries, by sheltering certain industries from foreign competition and by creating an environment in which legal and accounting expertise becomes more highly valued than managerial or technical skills (in affect, more time is spent fighting over the rules of the game and trying to adjust to the changes than is spent producing and distributing goods and services). Finally, these policies will increase prices and reduce the quality of commodities for consumers, thereby driving down consumer utility.

The income redistribution among industries occurs because not all industries are protected equally. For example, the earlier tariffs were primarily directed towards the industrial sector as opposed to the agricultural sector. This resulted in greater short term profits for those industries under the tariff "umbrella." However, because the farmer was forced to pay higher prices for manufactured goods, he was harmed by the tariff and actually experienced an erosion in his competitive posture visa vie foreign competitors.

More recent examples involves steel manufacturers. When tariffs were increased on steel imports, American automobile manufacturers were forced to pay a higher price for steel than Europe or Japan. This put American auto producers at a competitive disadvantage at a time when the domestic industry was already in a state of decline. Another example concerning steel was the implementation of "voluntary" steel quotas on Korea and Brazil in 1984, in order to assist our domestic steel industry. The unforeseen externality was the impairment of debt service by these two countries. This devalued the portfolios of the banks in the United States which held their debt. (Ref. 27:p. 78)

This redistribution is often politically motivated and usually results in capital being diverted from profitable and successful industries into struggling or non-competitive sectors. The historical preferential treatment of the steel, textile, and agricultural industries is a good example. All of these industries at one time represented very powerful voting blocs. Industries which were not sheltered would, like consumers, be forced to pay a higher price for the products which were protected, thereby driving up their own

manufacturing costs. They were also subject to the effects of retaliation by international trading partners which will be discussed in more detail shortly.

The second factor to be considered is the effects of sheltering certain industries. Although it can be argued that tariffs may benefit industries in the short term, it is very difficult to draw those same conclusions in the long term. As mentioned earlier, there are three industries which have benefited directly from tariff policies over the years: textiles, steel and agriculture. All three of these industries have experienced tremendous down sizing despite prolonged periods of tariff protection, and , in the case of both textiles and agriculture, direct and indirect subsidies. It is also quit clear that all of the leading industries today including high technology, telecommunications, and financial services, have received virtually no protection (although this does seem to be the sector that President Clinton is planning to target through his new "partnership" between the public and private sector).

Murray Wiedenbaum accurately stated that "if industries are not allowed to fail, what possible incentive could they have to succeed." By protecting industries over a prolonged period of time, you run the risks of encouraging corporate behavior which proves detrimental to its long term competitive posture. Even though tariffs are often formed as a short term fix to assist industries in getting back on their feet, history has shown that tariffs are much easier to create than they are to dismantle. These policies also rarely succeed in their stated goals. Instead, they create an industrial dependent class whose survivability is linked directly to the longevity of its political influence. It should also be

noted that most of the industries which are experiencing competitive problems from overseas are low skill, high labor intensive industries. It should only be natural that as our economy moves into the post industrial era that these industries will eventually fade away, at least in their current form.

As mentioned earlier, tariffs also run the risk of inviting retaliation which can quickly turn into a dangerous game of economic "chicken." The tariff wars which occurred during the Great Depression are perhaps the best historical example. Total imports into the United States declined from $4,339 million in 1929 to $1,325 million in 1932. Tariff rates on dutiable goods increased during this same time period from an average rate of 40 percent to 59 percent, which was the highest level since 1830. A more recent example would be the threat by the Clinton Administration to increase the tariff rates on imported steel. The European Community (EC) has already stated that such a rate increase would be countered by the EC with rate increases on American agricultural exports.

There is also the problem of politicizing the economic process to such an extent that lawyers and lobbyists become the prime capital investment. As Robert Baldwin points out, as industry and law become more sophisticated, "protection is often less than appearance would suggest, because there are many ways in which exporting countries can get around it and continue to increase their export earnings" (Ref. 20:p. 56). One such case involved the exportation of coats without sleeves, because the tariff rate for vests was below that of coats. Once the "vests" entered the country, they were reassembled as coats. There are also quotas on imports of pure cane sugar (defined as 100 percent

sucrose) into the United States. Importers are able to avoid this quota by simply adding sugar substitutes, such as dexstrose. And at one time, jogging shoes imported into this country used leather to construct the upper portion of the shoe in order to escape the high tariff rates on rubber footwear (Ref. 20:p. 56). All of these examples lead to one startling conclusion, lawyers may serve a useful function after all. However, there are costs associated with this avoidance. In all of these examples, the product had to be altered in some fashion. This could only result in increased production costs and or reduced quality. Then there is also the obvious costs of running your sales office out of a law firm.

Another problem with tariffs is that they are a very hidden tax, paid in part by corporations, but also by consumers. It is virtually impossible for the public at large to estimate their individual cost of a given tariff. If economic choices are going to be made through the political process, then the participants in that process must be able to evaluate both the costs and benefits of any given tax policy. If the individual benefits are made visible but the costs are hidden, then an informed decision becomes impossible. Rational calculations are then substituted for passionate rhetoric by those who have the most to gain. The lobbying by the "gainers" will almost always be stronger than that of the "losers." Gainers, although they may be far fewer in numbers, almost always gain more per capita than the losers forfeit, assuming that the losers are even able to calculate their loss. This will always create a bias in public policy for higher tariffs. It is for this reason that we should move away from taxes whose costs are difficult to estimate and which create both winners and losers within the body politic. A vocal minority, or for that

matter a voting majority, should not be allowed to use the tax code to its own personal advantage at the expense of someone else. Both the burden of taxation and the benefits of spending should be spread out as equally as possible.

Manipulating tariffs to promote an industrial policy and or the growing trend towards regional trade agreements could also undermine the GATT process (Ref. 28:p. 73). Outside of a GATT type system, powerful countries will be at a greater advantage in negotiating with Less Developed Countries (LDCs). We export manufactured goods to LDCs and then put up barriers to the importation of their agricultural goods. This not only prevents us from importing cheaper agricultural goods from abroad, but it denies the LDCs the U.S. Dollars they need to pay for additional American exports to their countries.

Finally, tariffs have the effect of increasing consumer prices since the duties will ultimately be passed onto the consumers. This reduces consumer utility. The added cost associated with protected commodities will also indirectly effect the demand for other commodities or services. The consumer will be left with less disposable income. It then becomes increasingly clear that tariffs represent at best a "zero sum game" in the short term. And in the long term it is hard to imagine a situation in which there are any winners at all.

V. CONCLUSIONS

Since the first question of whether or not an industrial policy has existed has already been answered in the affirmative, there are several other questions which must be addressed in determining whether an expanded role by DOD, and specifically ARPA, in non-DOD related investment projects is desirable. Is the government better able than the market place to spot sunrise industries? Does the government, and will DOD specifically, make investment decisions based primarily on national security interest, political concerns, or economic rational? Is government able to allocate resources towards industrial development in a way that is more efficient and effective than the private sector? Does federal involvement serve to strengthen or weaken the target industries? And can such a policy be implemented in a way that is fair and equitable to all players within our "social contract?"

No one has answered the first question more eloquently than Adam Smith.

> What is the species of domestic industry which his capital can employ, and of which the produce is likely to be of the greatest value, every individual, it is evident, can, in his local situation, judge much better than any statesman or lawgiver can do for him. The statesman, who should attempt to direct private people in what manner they ought to employ their capitals , would not only load himself with a most unnecessary attention, but assume an authority which could safely be trusted, not only to no single person, but to no council or senate whatever, and which would nowhere be so dangerous as in the hands of a man who had folly and presumption enough to fancy himself fit to exercise it. (Ref. 23:p. 423)

Although the primary goal of the initial policies governing both irrigation and railroads was to expand these industries quite literally into a new frontier, the policies soon changed from one of assisting new industries to protecting old ones. Few would be willing to argue today that agriculture and railroads represent the future of industrial development.

Nor can the case be made that the railroad subsidies and irrigation projects were desirable in terms of an overall cost benefit assessment.

To deal with the issue of whether the motivation behind the decision making process in the public sector deals with economic, political, or national security concerns, Robert Higgs points out that government growth and expansion into the private economy has historically been justified by a "crisis." Throughout American history, a crisis was most likely to take the form of a depression or war (Ref. 9:p. 17). Intervention wrapped in the cloak of a crisis has the advantage of rallying public support in an emotional frenzy for policies which would otherwise be unable to stand up to reasoned scrutiny.

In the late 1960's, Lyndon Johnson did exactly this by creating the perception of a poverty crisis. We then declared war on poverty with all the armament of the public treasury. If there was a notable trend associated with poverty, it was that poverty rates had been on the decline from 22.4 percent in 1959 to 12.1 percent in 1969 (Ref. 29:p. 245). If this indeed were a crisis, then the results of the policies which followed were surely Armageddon. But within the mind set of social tinkers, it is the effort and not the effect which is of prime importance.

In the case of railroads, irrigation, and tariffs, a "crisis" was created concerning the need for western expansion and the need to protect domestic industries. The concerns over western settlement were unfounded. And the costs of the policies clearly outweighed the benefits. In the case of tariffs, the need to protect key industries was often cloaked in the rhetoric of our national economic interest. Given the inverse relationship between tariff

rates and per capita GNP growth, it appears that effort and effect were once again on opposite sides of the fence.

Lessons from the past, however, are not always learned. Today we have all sorts of "crises" at our door step, ranging from health care to trade deficits and a "shrinking" industrial base. The one commonalty between all of these crises is that the answer always seems to includes more government involvement. The language has changed to meet the current political demands. Central planning has now been labeled "industrial policy." Subsidies and grants to private industries are now defined within the context of a "partnerships" between business and government. Higher tariffs are now defined as fair trade, with fairness being defined not by tariff rate comparisons, but by import/export ratios. It is likely that any future industrial policy will take the form of either a "*partnership*" *or protectionism*.

Even when ARPA is confined to its more traditional role of supporting DOD oriented research, the opportunity for abuse is enhanced as ARPA itself becomes more politicized. Industries which may not be critical to national security may be able to work their way into the funding pipeline. This is particularly true considering the current emphasis on dual use technology. Industries may argue that their product is important to DOD even though it is not DOD specific. Once this line of reasoning begins, it is difficult to see where it may end. Virtually any industry can claim some potential contribution to national security. Clearly, political considerations are a major component within the realm of public choice.

The issue of whether or not the government is able to allocate resources more effectively and efficiently than the private sector was answered by both railroad and irrigation policies. One need only look at today's over supply of rail capacity and the inefficient allocation of resources to both Conrail and Amtrak to see the inefficiencies associated with federal involvement. In addition, there are regulatory inefficiencies and other more broad based subsidies discussed in Chapter III.

Irrigation policy proved no more efficient. Eighty six percent of all federal dollars spent on irrigation projects never generated a return sufficient to justify the involvement. And those projects which did prove profitable may well have been funded through private vice public capital. Clearly, the industries studied in this thesis do not represent an efficient use of resources by the government. Government was only effective at creating excess capacity within both target industries.

In dealing with the issue of whether federal intervention serves to strengthen or weaken target industries, it is clear that railroads, farming, and numerous other industries such as textiles and steel, have long received a federal "umbrella" of subsidies or tariff protection. None of these industries have become self sustaining despite prolonged federal involvement. And all of these industries have continued to decline. It could be argued that a lack of federal involvement would have expedited this decline, however, this is difficult to conclude with any degree of certainty. Anytime a domestic industry is guaranteed a domestic market niche, they may lose the incentive to make the investment and management decisions enabling them to compete internationally. Instead, they may

decide to live comfortably within their own home market. The long term effect of this mind set would be inefficiency and the destruction of jobs within what could have been a profitable export industry. Clearly short term protection can translate into long term opportunity costs for the target industry itself. If DOD uses similar policies to support information technology research and development for purely private industrial gain, then decay and government dependency could be the future of the semiconductor industry and other target industries.

History clearly demonstrates that industries which are sheltered tend to have less of an incentive to make the difficult and painful decisions needed to compete and survive on their own. They instead become something of an industrial dependent class, lingering somewhere between the public and private sector, with a hand extended in either direction. As in the cases illustrated in this thesis, federal involvement tends to become a permanent, if not corrupting fixture within the industry. Since the relationship usually proves beneficial to both, those in authority have little incentive to terminate the relationship, even if it is to the detriment of the consumers and tax payers at large. The winners are easily identified, concentrated, organized, and therefore politically influential; the losers are more dispersed and less effected individually.

In dealing with any industrial policy, be it an existing or a proposed policy, there is also a basic question of fairness. Is it fair to change the rules in the middle of the game if it creates both winners and losers? If a policy change is promoted to create an overall Pareto Improvement, as most are, then shouldn't it be possible to create a situation in

which there are no losers? If we allowed only Pareto Optimal change within the realm of public choice, we would accomplish four basic objectives: we would insure that no one who is currently "playing the game" will be effected adversely by a rule change; public policy would have to be more closely linked with sound economic policy in order to meet the Pareto Optimal requirements; beneficial economic decisions would be easier to implement since losers would no longer be a byproduct of the process; and finally, the enhanced stability and continuity of the investment environment brought about by this change would prove beneficial to all, and would greatly assist business in making profitable long term investment decisions. (Ref. 25:p. 135)

To justify a change in public policy under these constraints, you would have to prove that those who benefit from the policy experience a large enough gain that they would be able to fully compensate the losers. If they are unable to achieve this objective, then it is clear that the costs of the change outweigh the benefits. For that reason, it is not a Pareto Improvement and should be rejected. The same standard of measurement should be used in justifying the existence or elimination of established programs or policies.

For railroads, irrigation, and tariff policies, those who would be direct and visible losers could be compensated for their loses in the short term by a cash voucher. Such a voucher could be fazed out over a period of time. Existing producers would have time to adjust and potential new entrants would know and be forced to conform to the new rules before hand. Some inefficiencies would continue to exist in the short term. However, the mere fact that farmers would now be able to use their "water voucher" to buy something other

than water, their "transportation voucher" to access modes of transportation other than rail, and their "subsidy voucher" to ensure that production is still subject to the market forces of supply and demand, would eliminate the inefficient externalities that currently exist. In effect, welfare would be called welfare. We would be able to more effectively and efficiently deal with it on that level. Cash subsidies as opposed to in kind subsidies would be beneficial to the recipients by expanding their options and increasing their utility. They would also be no more expensive to tax payers than the current system and would benefit consumers as a whole by reallocating resources in a way that eliminates many of the current market inefficiencies. And the greatest benefit would be the ability to phase out an inefficient program resulting in substantial long term savings.

However, good theory and good governance are not always the same. What would be difficult for a wise and virtuous Prince is no doubt quite *impossible in a democratic* environment. Such a policy would be difficult to implement in terms of costs calculations and just compensation. This would represent only the most visible problem. Within such a setting, decisions must be made by someone or body of advisors who no doubt would have their own agenda and interest to promote. So there would be no way to prevent the process itself from being turned into a political contest, much as it is today.

Perhaps the answer is to be found not in a new Prince, but in a reformed Constitution which deals with economic rights in much the same way that the current Constitution deals with political and civil rights. The issue of constitutional reform has been addressed

in somewhat different ways by both Milton Friedman and James Buchanan, and both present arguments which are at least worthy of serious discussion.

To summarize, if past efforts at central planning as outlined in this thesis are any indication of future results, future efforts would be both unfair to current "players" and entirely counterproductive. In the case of the railroads, irrigation policies, and tariff policies, the desired results were either not reached, outlived, and/or came at a price too high to justify whatever benefits were obtained. This is not to suggest that there is no such thing as market failure. It is only to suggest that there are also government failures. We should not be so quick to assume that government can succeed were markets have failed. Federal involvement may only exacerbate the existing problem, or create new ones. Policy makers must weigh market and government failures against one another.

The current administration believed the electorate capable and competent in their decision to send new leadership to Washington. If the citizenry is considered competent to make political decisions which effect everyone, why are we considered unable to make rational decisions concerning our own utility when left within the confines of free markets? The central issue concerning the advent of an expanded industrial policy is clearly not aggregate utility. The issue is power. We should be cautious because power is more easily surrendered than regained. We would be well advised to heed the warnings of Adam Smith.

APPENDIX A

AN HISTORICAL OVERVIEW OF EARLIER INDUSTRIAL POLICIES IN THE FORM OF GOVERNMENT INTERVENTION IN THE FREE MARKET

The following appendix will present a chronological ordering of various industrial policies enacted between 1789 and 1993. This is by no means an inclusive listing, but should adequately depict the nature of government involvement to date.

Although tariffs have always been used as a source of revenue generation, they were first used as an instrument of protection in 1816. Tariffs have been used extensively for this purpose to date and is covered in much greater detail in Chapter IV.

About 3,359 thousand acres of public land grants were awarded for the development of wagon roads between 1823 and 1869 (Ref. 1:p. 430).

About 4,599 thousand acres of public land grants were awarded for the development of canals between 1827 and 1867 (Ref. 1:p 430).

About 1,405 thousand acres of public land grants were awarded for river improvements between 1828 and 1847 (Ref. 1:p. 430).

The Homestead Act of 1862 offered 160 acres of land to a settler for the cost of a small filing fee, provided he lived on it for five years and built a house on the tract. Between 1862 and 1900, about 80 million acres were homesteaded (Ref. 2:p. 317).

The government operated Post Office expanded to include more territory, greater volume, and more services. In 1863 the Post Office began city deliveries. In 1864 they developed money orders. In 1885 they included special deliveries. In 1896 they expanded to include rural deliveries. In 1911 they added postal savings and in 1913 they added

parcel post. The Post Office was made a separate executive department in 1874 and the Postal Service was started in 1913. (Ref. 2:p. 345)

A grant of $100,000 a year was given to the Brazil Steamship Company from 1864 to 1875. The company went out of business in 1893. (Ref. 3:p. 396)

A grant of $500,000 a year was given to the Pacific Mail Company between 1865 and 1872, at the end of which time the amount was doubled. This grant was viewed as necessary to support operations between the West Coast and the Orient. The Pacific Mail Company was unable to compete with European lines and eventually went out of business. (Ref. 3:p. 396)

The Timber Culture Act 1873 gave 160 acres of land to any person who planted trees on one fourth of the total acreage. This requirement was changed to just 10 acres in 1878. "Tree claims" amounted to about 9,745,000 acres of land, mostly in Nebraska, Kansas, and the Dakotas. (Ref. 2:p. 318)

Munns vs. Illinois in 1877 upheld the right of a state to regulate businesses which "affected with the public interest." States then began to regulate prices in a variety of industries under the assertion that they represented public utilities. Most public utilities were now unable to do business without a franchise or permit from a state agency. (Ref. 2:p. 507)

The Desert Land Act 1877 required a down payment of 25 cents an acre on 640 acres with the agreement that a least part of the land would be brought under irrigation within three years. Upon proof that the land was being irrigated, and an additional payment of

one dollar an acre, title would be transferred to the settler. Final patents were issued on 2,674,695 acres (Ref. 2:p. 318). The Desert Land Act began what would be an extensive federal involvement in irrigation, especially in the western states. This involvement is covered in great detail in Chapter III.

Timber and Stone Act 1878 stated that after a properly qualified person swore that the land was unfit for cultivation and contained no valuable minerals, an individual could purchase up to 160 acres of the land at a cost of 2.50 dollars an acre. The law first applied only to Washington, Oregon, California, and Nevada, but in 1892 other "public land states" were included in the provision. (Ref. 2:p. 318)

The Postal Telegraph was the only rival to Western Union by 1886. But, the Postal Telegraph provided service to less than 800 towns, compared with 14,000 towns by Western Union. In 1910 the Interstate Commerce Commission (ICC) was given jurisdiction over the telegraph industry, and the companies in the industry were required to file reports directly to the ICC (Ref. 2:p. 345).

Beginning with the Interstate Commerce Act in 1887 and continuing up to the Staggers Act of 1980, numerous pieces of legislation regulated and subsidized rail, trucking and barge transportation. This legislation is discussed in great detail in Chapter II.

The Sherman Anti-trust Act of 1890 declared illegal every contract, trust, or conspiracy, in restraint of trade or commerce among the several states, or with foreign nations. Any person who monopolized or attempted to monopolize any part of trade or

commerce among the several states, or with foreign nations would also be guilty of a misdemeanor. (Ref. 4:p. 438)

In the case of Smyth v. Ames in 1897, the Supreme Court ruled that the price set by states for utilities must be high enough to allow the utility an opportunity to earn a reasonable rate of return on a fair value of its property. The Supreme Court used the Fourteenth Amendment and state court rulings to arrive at this decision. The effect of this ruling was to encourage utility rate setting by the courts vice state agencies. (Ref. 2:p. 507)

In the case of Flint v. Stone Tracy Company in 1909, the Supreme Court upheld that a corporate tax was an excise tax and therefore did not violate the constitutional provision against direct taxation (Ref. 2:p. 496).

The Sixteenth Amendment was ratified in 1913, authorizing a federal income tax (Ref. 2:p. 496).

The Federal Reserve Act of 1913 allowed national banks to lend money on farm mortgages, and agricultural paper running six months could be rediscounted at the Federal Reserve bank, whereas commercial paper, to be eligible for rediscount, must mature within three months (Ref. 4:p. 380).

The Clayton Act of 1914 was an extension of the Sherman Act. It forbid price discrimination between purchasers of commodities whenever such discrimination lessened competition or tended to create a monopoly. Corporations were forbidden from acquiring stock in another concern where the effect was to lessen competition substantially.

Interlocking directorates were no longer allowed in concerns engaged in interstate commerce whose capital, surplus, and undivided profits aggregated more then 1,000,000 dollars, if such companies were competitors. It was made unlawful in the case of banks for one person to serve as director or officer in another if the deposits, capital surplus, and undivided profits of any of the institutions exceeded 5,000,000 dollars. And unions and farmers' organizations were specifically declared not to be conspiracies in restraint of trade. (Ref. 4:p. 444)

The Federal Trade Commission Act 1914 established a five member body whose job was to investigate persons or corporations subject to the antitrust laws, and present reports of its activities. It was granted the authority to issue orders requiring the cessation of illegal practices. (Ref. 4:p. 444)

The LaFollette Seaman's Act of 1915 established a set of regulations governing basic working conditions for sailors (Ref. 4:p. 219).

The Federal Farm Loan Act of 1916 made it easier for farmers to obtain loans for periods of six months or more, and enabled them to secure funds at a lower rate of interest (Ref. 4:p. 380).

The Adamson Act of 1916 provided for a basic eight hour work day for interstate carriers in an attempt to head off a strike by the "operating brotherhoods" of railroad workers (Ref. 4:p. 466).

The Army Appropriations Act of 1916 allowed for the takeover of the railroads by the Federal Government on December 26, 1917. This takeover was to insure support for war time mobilization.

Adams and Company, Wells Fargo and Company, American Company, and the Southern Express Company were the sole surviving express companies by 1918. The government ordered these four companies to merge into one company called the American Railway Express Company. (Ref. 2:p. 345)

Agricultural Marketing Act of 1929 appropriated 500,000,000 dollars to be loaned by the Federal Farm Board to co-operative associations in the hope that this would promote orderly marketing (Ref. 4:p. 629)

Perhaps in a formal bureaucratic sense, this nations first experiment with industrial planning began with the National Resources Planning Board (NRPB), from 1933 to 1943. The board was created under the Hoover Administration and concerned itself with four broad tasks: planning and programming of public works; stimulation of city, state, and regional planning; coordination of federal planning activities; and research (Ref. 5:p. 3). Overtime the board drifted to the left. It advocated cradle-to-grave welfare programs in a controversial paper entitled, "Security, Work, and Relief Policies." In response, the newly elected Congress of 1942, displaying renewed conservative strength, cut off appropriations to the NRPB (Ref. 5:p. 12).

The First Agricultural Adjustment Act of 1933 established policies designed to reduce the supply of certain commodities. If cotton growers reduced their acreage at least 30

percent, they would be given options to purchase an amount of cotton equaling the amount they agreed not to grow. The government also granted "rental" or benefit payment to farmers of various crops for acreage temporarily taken out of cultivation. Marketing agreements were initiated which were designed to eliminate waste and provide for more scientific marketing (Ref. 4:p. 662). Farmers were also paid to plow up existing crops and kill livestock in an additional attempt to shore up supply (Ref. 5:p. 34).

The National Industrial Recovery Act of 1933 set general standards for the minimum wages. It was later declared unconstitutional in 1935. (Ref 2:p. 410)

Congress enacted the Tennessee Valley Authority in 1933 to erect a series of dams in the Tennessee Valley. These dams were to provide a cheap power source, a chain of lakes in the area, adequate flood control, and help to reforest the region. (Ref. 3:p. 456)

Funds were appropriated within the New Deal package to construct dams along both the Colorado and Columbia River in order to provide irrigation to those areas.

The Civilian Conservation Corps Act was enacted in 1933. It provided work for young men, most of whom were just out of high school but unable to find a job. (Ref. 3:p. 456)

The Second Agricultural Adjustment Act of 1938 maintained the same goals as the initial act. Its primary aim was to maintain "parity prices." These prices were established at 1909 through 1914 levels. The government set a "parity price" and quota each year for a given commodity. If the price fell below this mark, the government would, in part, recompense the farmers for the difference. If production in any given year substantially

exceeded the quota, then marketing quotas could be established by a two thirds majority of the farmers producing that commodity. (Ref. 4:p. 663)

The Fair Labor Standards Act 1938 further elaborated minimum wage standards (Ref. 2:p. 410).

The National Rail Passenger Act of 1971 created Amtrak in order to relieve the railroads of the burden of maintaining unprofitable passenger services. Railroads had to pay an initial amount for the transfer, then were required to give Amtrak national rail access below the actual costs for rail use.

The Regional Rail Reorganization Act of 1973 was passed in order to reorganize bankrupt railroads in the northeast into a federally owned and operated railroad known as Conrail.

SEMATECH was founded in 1987 and represents a joint government/industry research and development consortium. It receives DOD funding through the Advanced Research Project Agency. Its mission is to develop generic research and development to assure American dominance in the world semiconductor market. Consortium members include IBM, AT&T, HP, INTEL, Texas Instruments, NCR, Motorola, Rockwell, DEC, and National Semiconductor. The Federal Government has been contributing about $100 million annually to this consortium. This represents about half of SEMATECH's annual budget. (Ref 6)

The preceding policies clearly indicate that the Federal Government has been involved in an industrial policy for the last century. This appendix was not intended to evaluate the

worth of these policies but merely to identify their existence. Chapters II, III, and IV explore these policies in greater detail as they relate to the railroad industry, irrigation in the western states, and tariff policies. These discussions describe their effect on the targeted industries and the economy as a whole.

APPENDIX B

TAR/RATE = AVERAGE DUTIABLE AND FREE TARIFF RATE (%)
PR/CAP58 = PER CAPITA INCOME ADJUSTED TO 1958 DOLLARS
CURRENT = PER CAPITA INCOME IN CURRENT DOLLARS

YEAR	TAR/RATE	PR/CAP58	CURRENT
1799	8.37	448	131
1809	12.34	423	130
1819	23.31	359	93
1829	50.73	340	78
1839	17.57	410	98
1849	23.41	487	107
1859	15.43	613	140
1869	44.76	491	180
1879	30.33	641	147
1889	30.02	795	202
1890	29.59	836	208
1891	25.65	856	210
1892	21.65	920	218
1893	23.91	859	206
1894	20.56	819	185
1895	20.44	900	200
1896	20.67	865	188
1897	21.89	930	202
1898	24.77	933	210
1899	29.48	1,000	233
1900	27.62	1,011	246
1901	28.91	1,105	267
1902	27.95	1,093	273
1903	27.85	1,126	284
1904	26.29	1,092	279
1905	23.77	1,149	299
1906	24.22	1,258	336

1907	23.28	1,255	349
1908	23.88	1,130	312
1909	22.99	1,290	369
1910	21.11	1,299	382
1911	20.29	1,313	382
1912	18.58	1,366	413
1913	17.69	1,351	407
1914	14.88	1,267	389
1915	12.49	1,238	398
1916	9.08	1,317	473
1917	7.01	1,310	585
1918	5.79	1,471	740
1919	6.2	1,401	804
1920	6.38	1,315	860
1921	11.44	1,177	641
1922	14.68	1,345	673
1923	15.18	1,482	760
1924	14.89	1,450	742
1925	13.21	1,549	804
1926	13.39	1,619	826
1927	13.81	1,594	797
1928	13.3	1,584	805
1929	13.48	1,671	847
1930	14.83	1,490	734
1931	17.75	1,364	611
1932	19.59	1,154	465
1933	19.8	1,126	442
1934	18.41	1,220	514
1935	17.52	1,331	567
1936	16.84	1,506	643
1937	15.63	1,576	701
1938	15.46	1,484	651
1939	14.41	1,598	691

1940	12.51	1,720	754
1941	13.59	1,977	934
1942	11.51	2,208	1,171
1943	11.57	2,465	1,401
1944	9.45	2,611	1,518
1945	9.29	2,538	1,515
1946	9.9	2,211	1,475
1947	7.55	2,150	1,605
1948	5.71	2,208	1,757
1949	5.53	2,172	1,719
1950	5.97	2,342	1,877
1951	5.47	2,485	2,129
1952	5.3	2,517	2,201
1953	5.42	2,587	2,285
1954	5.17	2,506	2,247
1955	5.59	2,650	2,408
1956	5.67	2,652	2,492
1957	5.76	2,642	2,576
1958	6.44	2,569	2,569
1959	7.02	2,688	2,731
1960	7.4	2,699	2,788
1961	7.21	2,706	2,831
1962	7.5	2,840	3,004
1963	7.29	2,912	3,120
1964	7.2	3,028	3,296
1965	7.72	3,180	3,525
1966	7.57	3,348	3,815
1967	7.54	3,398	3,995
1968	7.08	3,521	4,306
1969	7.11	3,580	4,590
1970	6.5	3,555	4,808
1971	6	3,610	5,309
1972	6	3,749	5,777

1973	5	3,906	6,414
1974	4	3,849	6,886
1975	3.9	3,765	7,401
1976	3.9	3,911	8,175
1977	3.7	4,053	9,036
1978	4.1	4,222	10,105
1979	3.5	4,280	11,142
1980	3.1	4,223	11,995
1981	3.4	4,259	13,269
1982	3.6	4,108	13,614
1983	3.7	4,214	14,503
1984	3.7	4,457	15,913
1985	3.8	4,563	16,776
1986	3.6	4,643	17,511
1987	3.5	4,756	18,508
1988	3.4	4,920	19,783
1989	3.4	4,994	20,903
1990	3.3		

(Ref. 1:p. 224) (Ref. 1:p. 888) (Ref. 15:p. 434) (Ref. 15:p. 814) (Ref. 21:p. 130)

APPENDIX C

T_VL = TOTAL BOOK VALUE OF THE RAILROAD INDUSTRY ($1,000,000)
DEBT = TOTAL DEBT OF THE RAILROAD INDUSTRY ($1,000,000)
B/C = TOTAL BOOK VALUE / TOTAL DEBT
L_G = FEDERAL LAND GRANTS TO THE RAILROAD INDUSTRY IN ACRES (1,000)
FRA BUDGET = BUDGET OF FEDERAL RAILROAD ADMINISTRATION ($)

YEAR	T_VL	DEBT	B/C	L_G	FRA BUDGET
1991					948,234,000
1990					671,595,000
1989	67,661				573,887,000
1988	68,550				537,883,000
1987	66,760				718,528,000
1986	64,781				795,913,000
1985	64,241				1,078,757,000
1984	63,471				2,289,925,000
1983	62,964				1,329,967,000
1982	47,241				2,229,000,000
1981	46,619				3,610,000,000
1980	43,923				1,795,000,000
1979	40,498				1,651,000,000
1978	38,935				1,591,000,000
1977	38,342	14,881	2.58		1,333,000,000
1976	36,577	13,976	2.62		1,259,000,000
1975	40,196	13,473	2.98		486,822,000
1974	38,937	12,958	3		217,625,000
1973	37,897	13,092	2.89		116,531,000
1972	37,359	12,968	2.88		213,221,000
1971	38,022	13,588	2.8		67,784,000
1970	37,918	14,339	2.64		16,768,000
1969	37,383	14,701	2.54		18,570,000
1968	36,720	14,577	2.52		16,044,000

1967	37,250	14,690	2.54		21,974,000
1966	36,618	14,800	2.47		22,350,000
1965	35,489	14,857	2.39		
1964	34,868	14,876	2.34		
1963	34,519	15,011	2.3		
1962	34,361	15,013	2.29		
1961	35,541	15,179	2.34		
1960	35,513	16,134	2.2		
1959	35,157	16,365	2.15		
1958	34,934	16,603	2.1		
1957	34,614	16,775	2.06		
1956	33,714	17,399	1.94		
1955	33,034	17,422	1.9		
1954	32,708	17,590	1.86		
1953	32,416	17,658	1.84		
1952	31,822	18,067	1.76		
1951	31,077	18,220	1.71		
1950	30,174	18,274	1.65		
1949	29,519	18,343	1.61		
1948	28,664	18,249	1.57		
1947	27,686	18,050	1.53		
1946	27,277	18,449	1.48		
1945	26,967	18,681	1.44		
1944	26,631	19,403	1.37		
1943	26,145	19,914	1.31		
1942	25,838	20,471	1.26		
1941	25,668	20,708	1.24		
1940	25,646	21,047	1.22		
1939	25,538	23,609	1.08		
1938	25,595	23,855	1.07		
1937	25,636	24,123	1.06		
1936	25,432	24,003	1.06		

1935	25,500	22,080	1.15		
1934	25,681	24,570	1.05		
1933	25,901	24,723	1.05		
1932	26,086	24,837	1.05		
1931	26,094	24,344	1.07		
1930	26,051	22,783	1.14		
1929	25,465	23,983	1.06		
1928	24,875	23,747	1.05		
1927	24,453	23,614	1.04		
1926	23,800	23,677	1.01		
1925	23,217	21,734	1.07		
1924	22,182	23,636	0.94		
1923	21,372	22,839	0.94		
1922	20,580	22,290	0.92		
1921	20,329	22,292	0.91		
1920	19,849	20,098	0.99		
1919	19,300	20,950	0.92		
1918	18,984	20,785	0.91		
1917	18,574	21,249	0.87		
1916	17,842	21,049	0.85		
1915	17,441	19,720	0.88		
1914	17,153	20,247	0.85		
1913	16,588	19,796	0.84		
1912	16,004	19,753	0.81		
1911	15,612	19,209	0.81		
1910	14,557	18,417	0.79		
1909	13,609	17,488	0.78		
1908	13,213	16,768	0.79		
1907	13,030	16,082	0.81		
1906	12,420	14,570	0.85		
1905	11,951	13,805	0.87		
1904	11,511	13,213	0.87		

1903	10,973	12,600	0.87		
1902	10,658	12,134	0.88		
1901	10,405	11,688	0.89		
1900	10,263	11,491	0.89		
1899	9,961	11,034	0.9		
1898	9,760	10,819	0.9		
1897	9,709	10,635	0.91		
1896	9,500	10,567	0.9		
1895	9,203	10,347	0.89		
1894	9,073	10,191	0.89		
1893	8,937	9,895	0.9		
1892	8,690	9,686	0.9		
1891	8,444	9,291	0.91		
1890	8,133	8,984	0.91		
1889	8,598	9,680	0.89		
1888	8,344	9,369	0.89		
1887	7,799	8,673	0.9		
1886	7,254	8,163	0.89		
1885	7,037	7,842	0.9		
1884	6,924	7,676	0.9		
1883	6,684	7,477	0.89		
1882	6,035	7,016	0.86		
1881	5,577	6,278	0.89		
1880	4,653	5,402	0.86		
1879	4,416	4,872	0.91		
1878	4,166	4,772	0.87		
1877	4,180	4,806	0.87		
1876	4,086	4,468	0.91		
1875		4,658			
1874		4,221			
1873		3,784			
1872		3,159			

1871		2,664		3,253	
1870		2,476		129	
1869		2,041			
1868		1,869			
1867		1,172		23,535	
1866					
1865				41,452	
1864				2,349	
1863				30,877	
1862					
1861					
1860		1,149			
1859					
1858					
1857				6,689	
1856				14,085	
1855		763			
1854					
1853				2,629	
1852				1,773	
1851				3,752	
1850		318			
1849					
1848					
1847				840	
TOTAL				131,363	23,610,378,000

(Ref. 1:p. 734-735) (Ref. 1:p. 430) (Ref. 15) (Ref. 30)

APPENDIX D

M_REQ = MILES OF TRACK REQUESTED TO BE ELIMINATED
M_GRANT = MILES OF TRACK ALLOWED TO BE ELIMINATED
MILES = TOTAL MILES OF TRACK
R_EXP/REV = RAILROAD EXPENDITURES/RAILROAD REVENUES

YEAR	M_REQ	M_GRANT	MILES	R_EXP/REV
1991				
1990				
1989			249,000	0.9
1988			251,000	0.89
1987			254,000	0.9
1986			256,000	0.95
1985			257,000	0.91
1984			264,000	0.88
1983			270,000	0.9
1982				0.96
1981	3,339	3,539	278,000	0.93
1980	4,487	2,542	290,000	0.93
1979	4,055	2,936	300,000	0.95
1978	3,379	2,417	310,000	0.97
1977		2,017	320,000	0.84
1976	1,634	1,788	314,000	0.82
1975	3,308	708	340,000	0.83
1974	2,247	529	354,000	0.79
1973	4,436	2,428	354,000	0.79
1972	3,978	3,458	356,000	0.8
1971	3,142	1,287	359,000	0.8
1970	1,762	1,782	360,330	0.8
1969	2,287	1,320	364,915	0.79
1968	2,036	1,890	366,238	0.79
1967	860	817	368,030	0.79
1966	1,920	1,054	370,104	0.76

1965	2,224	1,538	370,636	0.77
1964	1,528	811	372,300	0.78
1963	1,937	1,688	374,522	0.78
1962	1,616	1,582	376,290	0.79
1961	1,140	1,167	379,415	0.79
1960	1,602	772	381,745	0.79
1959	1,203	1,180	383,912	0.78
1958	2,062	1,825	385,264	0.79
1957	1,190	589	386,978	0.78
1956	731	822	389,668	0.77
1955	975	514	390,965	0.76
1954	498	873	392,580	0.79
1953	976	1,102	393,736	0.76
1952	1,294	1,306	394,631	0.76
1951	815	564	395,831	0.77
1950	886	955	396,380	0.74
1949	1,178	1,185	397,232	0.8
1948	781	907	397,203	0.77
1947	1,074	1,241	397,355	0.78
1946	1,747	670	398,037	0.83
1945			398,054	0.79
1944			398,437	0.67
1943			398,730	0.63
1942			399,627	0.62
1941			403,625	0.69
1940			405,975	0.72
1939			408,350	0.73
1938			411,324	0.76
1937			414,572	0.75
1936			416,381	0.72
1935			419,228	0.75
1934			422,401	0.75
1933			425,664	0.73

1932			428,402	0.77
1931			429,823	0.77
1930			429,883	0.75
1929			429,054	0.72
1928			427,750	0.73
1927			424,737	0.75
1926			421,341	0.73
1925			417,954	0.74
1924			415,028	0.76
1923			412,993	0.78
1922			409,359	0.79
1921			407,531	0.83
1920			406,580	0.94
1919			403,891	0.86
1918			402,343	0.82
1917			400,353	0.71
1916			397,014	0.66
1915			391,142	0.71
1914			387,208	0.73
1913			379,508	0.7
1912			371,238	0.7
1911			362,824	0.69
1910			351,767	0.67
1909			342,351	0.67
1908			333,646	0.7
1907			327,975	0.68
1906			317,083	0.66
1905			306,797	0.67
1904			297,073	0.68
1903			283,822	0.66
1902			274,196	0.65
1901			265,352	0.65

1900			258,784	0.65
1899			250,143	0.65
1898			245,334	0.66
1897			242,013	0.67
1896			239,140	0.67
1895			233,276	0.67
1894			229,796	0.68
1893			221,864	0.68
1892			211,051	0.67
1891			207,446	0.67
1890			199,876	0.66
1885			125,000	
1875			75,000	
1865			35,000	

(Ref. 1:p. 727-728) (Ref. 15:p. 621)

APPENDIX E

REHAB = LOANS FOR THE REHABILITATION OF RAIL LINE ($)
RR PROG = LOANS FOR RAILROAD PROGRAMS ($)
US RW ASSOC = LOANS FOR THE U.S. RAILWAY ASSOCIATION ($)

FEDERAL LOANS TO THE RAILROADS:

YEAR	REHAB	RR PROG	US RW ASSOC
1988	11,000,000		
1987			
1986			
1985	2,000,000		
1984	48,000,000		
1983	46,000,000		
1982	41,000,000	3,000,000	
1981	36,000,000	3,000,000	
1980		131,000,000	641,000,000
1979		73,000,000	708,000,000
1978			735,000,000
1977			723,000,000
1976			309,000,000

(Ref. 30)

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